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## Open-Source Schematics

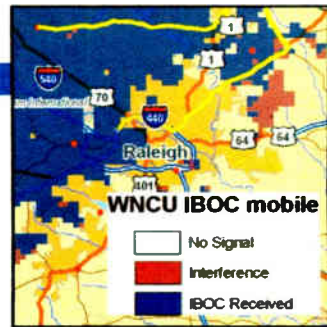
TinyCAD is a free open-source schematic capture program for Windows. See *Workbench*.

Page 10

## Digital Coverage

NPR Labs seeks answers about the difference in coverage between FM IBOC and analog.

Page 22



# Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

July 2, 2008

## INSIDE

### BUYER'S GUIDE

▼ Who's making what in consoles, mixers and routers.



Page 30

### ENGINEERING

▼ Skip Pizzi says radio may have gotten a little flabby lately, but it's not dead yet!

Page 12



▼ Northwest Public Radio nears completion of its HD Radio rollout. RW talks to the chief telecommunications engineer about the \$1.9 million project.

Page 16

▼ Several gems of radio history are now part of the National Recording Registry.

Page 19

### OPINION

▼ Glenda Shrader Bos says the 'Radio 2020' campaign is ill-conceived and doomed to fail.

Page 45

▼ In support of an FM digital power hike.

Page 46

## U.S. Test Would Explore DRM at High Latitudes

*Proposed Tests in Alaska, Potentially Funded by The Defense Department. Generate Curiosity*

by Leslie Stimson

**DELTA JUNCTION, Alaska** It's just one test of Digital Radio Mondiale technology, in one very big state. But could the results lead to a new kind of regional radio service in which U.S. broadcasters use shortwave to reach listeners *within* the United States, something they're not now allowed to do?

It's too soon to tell. However an application for an experimental license to transmit a digital radio signal here on three shortwave channels using DRM has raised the curiosity of some observers.

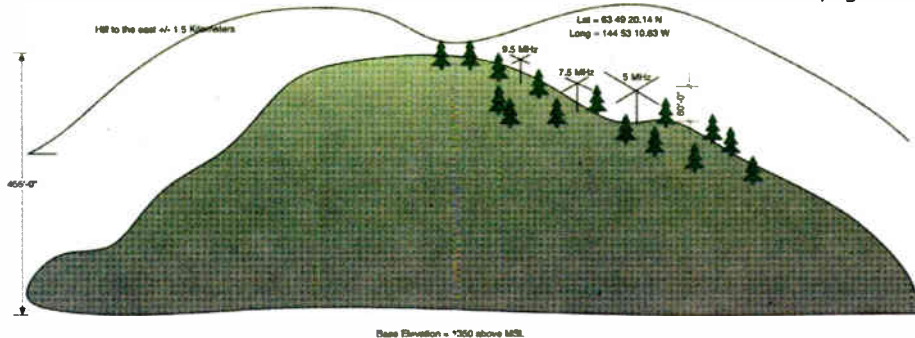
The president of Digital Aurora Radio

Technologies has asked the FCC to approve a two-year experimental authorization to test statewide transmission of DRM in the 5, 7 and 9 MHz shortwave bands.

In its FCC application, Digital Aurora states: "Pending this [FCC] authorization and funding availability, initial tests will likely be tasked and funded by the U.S. Government Department of Defense, Joint Electromagnetic Technologies Program." Details of that program are said to be classified.

An unclassified 2002 budget document posted on the Web site [www.js.mil](http://www.js.mil) said the JET Program "supports the Defense

See ALASKA, page 5 ▶



An antenna placement graphic from Digital Aurora Radio Technologies.

## Will the EAS House Be Put in Order?

*Questions Persist About Funding and Timing of a Next-Generation System*

by Randy J. Stine

**WASHINGTON** Moving too slowly for some but not wanting to rush, Federal Emergency Management Agency officials believe the process to develop the next generation of the Emergency Alert System is on track. They expect to announce a position on adopting the Common Alerting Protocol by the end of July.

Many broadcasters and those in the emergency management arena are pushing FEMA to adopt CAP formally as the official data protocol for creating and sending emergency messages. The Federal Communications Commission has given its provisional endorsement of CAP.

However, the commission's 2007 Second Report and Order on EAS stipulated that broadcasters would have 180 days to adopt whatever EAS protocol FEMA develops. It was unclear in June when that time window would begin, though EAS experts contacted by RW

See EAS, page 6 ▶

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# NEWSWATCH

## BIA Predicts Small-Market Revenue Growth

**CHANTILLY, Va.** While radio revenue in large markets remains flat, small and medium-sized cities are showing minor gains in revenue and a better outlook than their top-10 peers.

BIAfn reports that large radio markets "continue to struggle" in its quarterly "Investing in Radio Market Report." It said markets 11th and higher "will see better revenue growth quicker from the

slump in the industry due to local advertising support, differences in competition and their audience's embrace of technological improvements."

Markets expected to see increases this year include McAllen-Brownsville, Texas (2.8 percent), El Paso, Texas (3.8 percent), Madison, Wis. (1 percent), and Baton Rouge, La. (3 percent).

In contrast, BIAfn doesn't expect to see large-market stations return to return to double-digit growth anytime soon.

BIAfn Vice President Mark Fratrick thinks listeners are "beginning to respond favorably to the digital innovations their favorite stations are making through multicasting and live audio streaming.

enhanced Web sites and HD Radio."

## Coleman: Teens Support New Tech Over Radio

**RESEARCH TRIANGLE PARK, N.C.** Coleman Insights says teenagers' use of computers, iPods and MP3 players for music consumption, in some instances, is greater than their use of FM radio and has reached "a tipping point."

For the first time, its research is showing that teens support new technologies

over radio.

In a study for a CHR station in a top 20 market, Coleman found 84 percent of 14- to 17-year-olds reported listening to music on a computer, iPod or MP3 player every day. The figure for listening to AM or FM radio was 78 percent.

"Where is the first place you go to hear music," the research firm asked in a separate study. In response, 41 percent of 15- to 17-year-olds said iPods or other MP3 players, 27 percent said their computers and 22 percent said FM radio.

Company President Jon Coleman said the numbers should convince stations that they have to determine how radio can fit into the lifestyles of younger listeners.

## News Roundup

**HARRIS** isn't for sale. Responding to market speculation and rumors, the parent of Harris Broadcast said that from time to time it is approached by other companies with expressions of interest in various types of transactions, including a potential sale. But Chairman/President/CEO Howard Lance said in a statement that the company is not pursuing a merger or a sale. "The board of directors and I have great confidence in this company, its employees and its future chairman, president and chief executive officer. Harris is uniquely positioned, with access to both government and commercial technologies, to continue to effectively serve the challenging requirements of our growing global assured communications markets."

**WORLDSPACE** won a reprieve from See NEWSWATCH, page 8 ▶



## MEET THE SQUARE

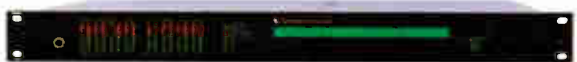
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**88E DIGITAL ENGINE:** Just plug an E-SERIES control surface or GLASS E computer interface into this engine and get all the mixes, mic and signal processing you need. Fanfree, so it can stay in the studio where it belongs.



**88A I/O:** 8 analog inputs and outputs. You can bring a new SQUARE up in seconds and of course use the front panel encoder for your X-Y control. Front panel status LEDs give you continuous link, status, and bit rate information as well as confirmation of any GPIO activation.



**88AD I/O:** 4 analog plus 4 digital inputs and outputs—perfect for small studios or standalone routing.



**88 I/O CONNECTIONS:** E<sup>2</sup> has both DB-25s for punchblock interface and RJ-45s for point-to-point interface. All SQUAREs have 12 individually configurable opto-isolated logic ports that can be either inputs or outputs.

Because the E<sup>2</sup> system doesn't rely on a third party GUI, tech support is straightforward (and 24/7). Likewise, system operation doesn't require external PCs for continued full functionality. Best of all, 1 Gigabit protocol eliminates the latency and channel capacity restrictions associated with older technology.

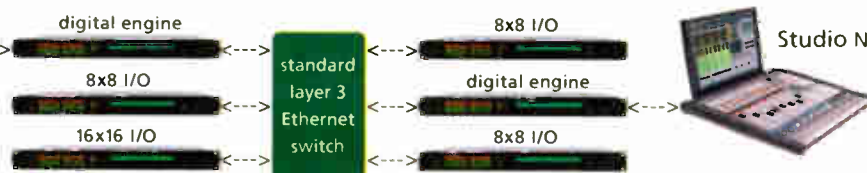
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## Index

### NEWS

U.S. Test Would Explore DRM at High Latitudes	1
Will the EAS House Be Put in Order?	1
NewsWatch	2
What's Happening With DRM in the U.S.?	3
From the Editor	4

### FEATURES

Workbench: A DVR Sentry Watches Your Site	10
Survival in a More Competitive World	12
NWPR Nears Completion of HD-R Rollout	16
First Transatlantic Broadcast, Other Gems Are Now in National Recording Registry	19
Yamaha Pocketrack 2G Breaks Size Barrier	20
CBS Radio Covers Atlanta With BE FMi 703	28

### HD RADIO NEWS

Researchers Explore Digital Coverage	22
HD Radio Scoreboard	23

### BUYER'S GUIDE

Livewire: Cost-Effective Routing Control	30
SAS: Working 24/7 for the Live Jocks	32
WVUD Upgrades and Expands With Aeon	33
EITB Installs Arena, BC-2000D in Spain	34
Logitek Consoles On-Air in Bellevue	36
Clear Channel Chooses E-6 for FM Stations	38
Cox Outfits 'Rick and Bubba' With Harris	39
Jazz Network Packs SixMix for the Show	40

### OPINION

Radio 2020: Ill-Conceived and Doomed to Fail	45
Don't Wait for the Future	46

AMERICAN SHORTWAVE

# What's Happening With DRM in the U.S.?

*Messer Says Organizations Are Exploring Local And Wider Uses for the System in This Country*

by Jeff White

The following was reported by the National Association of Shortwave Broadcasters, summarizing a presentation given at the NASB-U.S. DRM annual meetings in Cary, N.C.

Dr. Donald Messer left the DRM Consortium at the end of March. Some months earlier he had relinquished his role as chairman of the Technical Committee of the DRM Consortium. He is now actively involved in promoting Digital Radio Mondiale in the United States.

At the USA DRM annual meeting May 8 in Cary, N.C., he talked about some of the activities he has been involved in during the past several months regarding DRM transmissions "from the U.S. to the U.S."

Messer said there are two major elements involved in domestic DRM broadcasting in the United States. One is getting the FCC to approve domestic shortwave broadcasting, which is not permitted currently. Experimental testing is needed for this.

The second element is building a constituency by doing developmental work to be able to convince the FCC that domes-

power FM community radio stations.

Using DRM on 26 MHz would reduce the political pressure that the FCC is receiving from both sides — the NAB on one and, for example, universities and religious organizations on the other. These low-power DRM stations would cover 10–100 square miles.



Relaxing at a break at the NASB meeting, from left: Roger Stubbe of HCJB; Charlie Jacobson of the HCJB Global Technology Center; and Dr. Donald Messer, former chairman of the DRM Consortium's Technical Committee.

kHz DRM signal with up to four languages of audio to cover the entire state using old 100-kilowatt Defense Department transmitters near Fairbanks.

Says Messer: "The Cold War ended, so the transmitters are up there and are not being used."

He says he is working with a company located near Fairbanks that would eventually like to provide a digital audio service throughout the state of Alaska.

Does he think the project will be

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tic DRM has value, includes local content, etc. Thus, we are dealing with getting digital modulation approved in the HF broadcasting bands for domestic use.

As far as medium-wave is concerned, Messer agreed with those who have said that it has to be an analog-DRM simulcast on adjacent channels. "You can't disturb the analog transmissions," he said.

He noted that very successful simulcast DRM medium-wave tests have been conducted in Mexico, Brazil and India.

Messer explained that DRM+ includes all the broadcasting bands above 30 MHz and below 108 MHz. He insists that "there is some activity, although very limited, in the United States with regard to trying to get experimental licenses for DRM+."

**Shortwave**

But shortwave is where most of the activity is with DRM in the United States. Messer divides this into three categories: local coverage on 26 MHz, regional coverage and traditional shortwave broadcasting for long-distance coverage.

On 26 MHz, Messer said transmitters of 200 watts or less can provide local community radio services. He noted 26 MHz is a natural alternative for the FCC, given the controversy about using channels within part of the existing FM band for low-

Messer says at least three organizations are working with him on developing DRM tests on 26 MHz for local coverage, but no experimental licenses have been issued yet.

The second category of DRM on shortwave is a medium-range regional service.

**Without trying to minimize the value this has to Alaska, this is transportable to other places in the U.S.**

— Don Messer

Messer explained that he has been working with a group that has filed an application for at least two years of experimental operation in Alaska, and the FCC has recently accepted that application for evaluation. (See story, page 1 of this issue.)

"Alaska is roughly twice the size of Texas," said Messer, "so you're talking about a fairly large regional coverage."

The plan is to use a 10 or maybe 20

approved? "My guess is that the FCC evaluators will approve this application sometime before the end of this year when the cold sets in and the sun doesn't rise anymore. We will have the antenna field constructed in accordance with a very good antenna design. Then starting next year when the snows go away ... we will start experimental broadcasting."

Messer cites two key reasons why he thinks the FCC will approve the Alaska application.

First of all, he says there isn't much information about ionospheric propagation at latitudes of around 60 degrees north with regard to how a digital signal such as DRM would work for a broadcasting service. "So this is pioneering," he says.

Secondly, the Alaska population outside of Anchorage, Fairbanks and Juneau is sparse. Taking this to a global level, Messer says: "If a country has half its population living in three cities, what about the other half?"

He criticized some Voice of America research in parts of the world like West Africa that has been used to downplay the importance of shortwave in favor of FM and Internet. Messer asserts that often this research has not taken rural areas sufficiently into account — areas that still

See DRM, page 5 ►

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# Merger: Bad Idea, Then and Now

To allow a merger of Sirius and XM is, on balance, in the public interest. So says Kevin Martin after due deliberation.

Both the FCC chairman and the U.S. Justice Department have a funny idea of the public interest.

The regulators are about to hand control of a piece of the spectrum larger than what all other U.S. commercial and public radio stations occupy — combined — to a single, multibillion-dollar corporation. How is the public interest served by doing that?

These regulators answer to the needs of millions of consumers and thousands of existing broadcast and new media businesses. The appointed officials occupy an artificially created, but still necessary, role: that of spectrum traffic cop.

Now those road troopers are going to give the driver of a single, huge double tractor-trailer permission to career down the highway free of restrictions that apply to everyone else in the radio broadcast lane — in fact to do so in its own special lane.

If you accept the frequent argument that big U.S. commercial broadcasters often misuse their spectrum by not serving the public interest, convenience and necessity — a contentious point, but one that finds a more receptive ear on this page than at most radio trade publications — how does it make sense to hand control of a yet more massive piece of spectrum to one large business entity (which, by the way, will be run by managers who helped create the very world of modern commercial radio that so many profess to detest)?

I supported establishment of satellite radio against the wishes of many in radio because I believed it was an appropriate exploration of new technologies and competition in use of the spectrum. However, regulators who licensed those two services (over competing claims) also established a prerequisite that a merger must not be allowed; they did so for a reason.

Those commissioners weren't idiots; they already knew the media marketplace was blossoming into many choices. Proliferation of further competition since then doesn't make their original intentions irrelevant.

The regulators established such a restriction, in my view, because to hand control over a huge piece of spectrum to one and only one company would be nothing more than a federal giveaway of massive scope that would not benefit consumers and would be patently unfair to other businesses already competing in the broadcast arena under longstanding federal guidelines.

No amount of twittering around the edges with a la carte programming or minority set-asides is going to change that fact.

As I write, it's unclear whether the FCC will follow in Martin's path, but it's looking more and more likely that it will and that a merger will be approved.

In that case, if I were Clear Channel or CBS or even public radio, I'd be thinking very hard about how to put this new precedent to my own good use.

I'd call for an immediate, dramatic easing — if not elimination — of ownership caps in each market in light of the monumental change in how regulators are now administering their charge to regulate access to broadcast mass media channels in a way that serves the public's interest.

I personally am not a fan of trends in commercial radio programming over the past 20 years; and I don't think it would be good public policy to allow Clear Channel or anyone else to obtain dramatically more spectrum; yet to do so would be far less ridiculous on its face than a satellite monopoly.

(I'm not the only one thinking that way. David Rehr at NAB raised the point in a 2007 letter to Rep. John Conyers: "Could one company purchase every radio station in a market, or the entire country for that matter? Could Apple Inc. acquire a merged XM-Sirius?")

If regulators, satellite investors and anti-NAB fanatics can convince our government to allow such a massive corporate handout, why shouldn't Clear Channel take advantage of the same government largesse? Merger supporters: Be careful what you wish for.

Meantime, I repeat predictions I made a

year or more ago. After XM and Sirius merge, you eventually will see higher prices for satellite content, far more paid ads and fewer unique channels, with less consumer choice. You will get, in short, a company that reproduces the ills many people today attribute to bland corporate U.S. radio.

Even with such failings, though, I'd argue that XM and Sirius should be free to run their businesses as they see fit, like commercial radio largely is, and to fail if that's what the market decides.

But they should not be allowed to drive down that road together as one company, free of direct competition within a vast, protected portion of priceless spectrum highway.

★ ★ ★

A word of welcome for Bud Mayer, Radio World's new regional sales manager for the western United States plus Canada.



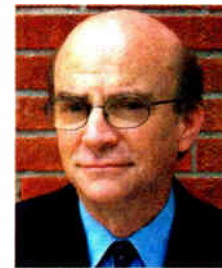
Bud Mayer

Carl F. Mayer III, a native of Ohio, has been working in the music and pro audio industry for 25 years; he

was a keyboard clinician and product manager for Kaman Music in the mid-'80s, then joined Canadian pro audio manufacturer Yorkville Sound, where he was as VP/GM, directing U.S. sales, marketing and distribution.

Bud also helped found A-Line Acoustics, a manufacturer of line array speaker systems; his marketing and sales work helped make the brand a national competitor in concert speakers.

Like so many good people in our business, he has a keen interest in music. He's a two-time American Song Festival award winner who attended the University of Hartford's Hart College of Music and Interlochen Arts Academy (National Music Camp), where he also took a course



Dave Carson

He was account manager with Front of House and Production Lights and Staging News, and is the former associate publisher and national sales manager of the U.S. edition of Audio Media magazine; he also was U.S. sales manager for that publication's international editions.

Dave is a former jock for several stations in the Midwest (he's from Detroit) and worked in sales and marketing for Paxson Radio Networks. He wrote the books "Rockin' Down the Dial: The Detroit Sound of Radio, From Jack the Bellboy to the Big 8" and "Grit Noise and Revolution: The Birth of Detroit Rock 'n' Roll," winner of the ARSC Award for Excellence in Historical Sound Research.

E-mail Bud Mayer at [cmayer@nbmedia.com](mailto:cmayer@nbmedia.com) and Dave Carson at [dcarson@nbmedia.com](mailto:dcarson@nbmedia.com). Welcome to both!

## From the Editor



### Paul J. McLane

in radio production. He has written and recorded music for TV and radio including work for Connecticut Public Television, The Hartford Civic Center and Aetna Insurance Company.

Bud still performs professionally on piano and keyboards and directs two choirs.

He also tells RW that when he was in high school, he played at radio with friends in the basement of his dad's house.

Separately, NewBay Media has named David Carson as specialty sales director for Radio World newspaper and TV Technology magazine, assuming responsibility for Classified and Product Showcase ad sales.

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# Alaska

► Continued from page 1

Community in general with a particular emphasis on the requirements of Special Forces and Intelligence in their Weapons of Mass Destruction (WMD), Deep Underground (DUG) and Transnational Threat (TNT) missions. This is in the form of basic research and applied RDT&E in HF/VLF/ELF communications and signaling, advanced forms of optical communications, underground imaging and advancing our understanding of the propagation of all forms of RF communication."

DRM is an open standard, designed for the digitization of the frequencies below 30 MHz: long-, medium- and shortwave. It's used mostly on shortwave frequencies in European and other countries.

An extension called DRM+ is in the works. The DRM Consortium — comprising broadcasters, associations, network operators, manufacturers, research institutions, regulatory bodies and others — plans to expand the system to broadcasting bands up to 120 MHz.

## Application pending

On its application, the company said the goal is to assess performance of digital terrestrial shortwave broadcasting and serve the entire state.

"In general, the population of Alaska is underserved with respect to the ability to have a high-quality, reliable public radio audio service," the company wrote. "This is especially true for sparsely populated areas of the state," though that statement discounts public stations, which cover much of Alaska.

Company President Whit Hicks declined comment for this story, saying he did not want to "presume" FCC approval. An Internet search turned up no prior information on the company, which submitted the application in late April. The application remained pending in June.

A source close to the issue said the request was not controversial and that

approval of the experimental license could come this summer.

That timeframe is key to Digital Aurora, because many of the submitted measurements regarding sunspots could change as the year goes on. Also, the company needs to build an antenna in Alaska, where severe weather allows a short time period for construction and accessing the site.

It plans to construct a crossed dipole antenna with an overall height above ground of 20 meters, roughly 66 feet.

According to the application, the potentially DoD-funded test would use existing 100 kW Continental transmitters designed for an Over-the-Horizon radar transmitting system formerly used in Cold War broadcasting and a digital signal generator operating from the Delta Junction area, some 130 miles southeast of Fairbanks.

One transmitter producing output average power of 20 kW, in concert with an antenna that sends most of its radiated power into Alaska, should be able to be received throughout the state, the company believes.

However, Digital Aurora needs to determine if such reception can be accomplished during times of high and low solar activity.

DRM has been tested extensively in latitudes lower than those that include Alaska. This experiment, the company said, will help to fill a gap in assessing the performance of digital terrestrial shortwave broadcasting in a difficult high-latitude environment.

## Antenna spec

The company hopes also to determine what transmission power levels will produce a reliable signal that can be received on DRM radios. Digital Aurora also hopes to determine an antenna specification to deliver a signal statewide.

Digital Aurora proposes to perform propagation, signal-to-noise ratio, field strength, bit rate and audio quality measurements over a two-year period, according to the application.

"Compared to an ordinary analog

help us out with some domestic broadcasting." He noted that the International Broadcasting Bureau is a DRM member.

Messer realizes that the big challenge in the long term for these domestic shortwave DRM applications is that the FCC would have to change its rules to permit domestic broadcasting of digital signals from the U.S. to the U.S.

In summary, for DRM on medium-wave in the United States, Messer says "the technical capability is there. I think the market there depends on how well HD Radio does in the medium-wave band over time." For shortwave — local community services, Alaska-type regional services, and long-range DRM services — the question is, "Are there markets — perhaps niche markets — in the U.S. for this kind of broadcasting? The kinds of things I am talking about within the U.S. will require at least 1 to 2 to 3 years of testing."

"By that time, if there aren't consumer receivers ready, forget you heard this speech."

Meanwhile, Messer pointed out that there are currently shortwave DRM transmissions to the United States from Canada, Bonaire, French Guiana and other sites. And "nobody can prevent some Mexican entrepreneur from broadcasting out of Chihuahua or something like that as long as it's coordinated with the HFCC."

shortwave signal, the DRM signal can operate with the same coverage reliably ... in a 10 kHz channel using a transmitter power level approximately one-fifth of that needed for the analog signal," states Digital Aurora in the application. The FCC assigned call sign WE2XRH.

DRM is designed to fit in with the existing AM broadcast band plan, based on signals of 9 kHz or 10 kHz bandwidth, according to the Web site [www.drm.org](http://www.drm.org). It also has modes requiring only 4.5 kHz or 5 kHz bandwidth, and modes that can take advantage of wider bandwidths, 18 kHz or 20 kHz.

The cost of the test was not listed on the application, which stated that utilities and space would be leased and the existing government-provided transmitters left in place when the experiment ends.

Digital Aurora believes it can contain most of the signal within Alaska with little spillover into Canada. To avoid causing interference it plans to stay at least two adjacent channels away from any channels used by international broadcasters into western Canada.

The two-year test proposal appears notable because it would be the first time DRM has been tested in the United States at such high latitudes, and because the company is proposing to broadcast using digital shortwave technology to an entire state.

Without knowing more about Digital Aurora's intentions, it's hard to know the practical implications of the test, observers said.

While engineering observers laud DRM technically, they said it's hard to make a practical business case for DRM on shortwave in this country, noting that several countries are abandoning shortwave and turning to less expensive programming distribution platforms such as the Internet and FM.

"What new audience that isn't presently served will be covered and at what cost per person?" asked one observer.

Several sources raised the issue of DRM receiver availability. Indeed, in a separate paper presented at the NAB Show on standards and codecs for digital radio in Europe, Fraunhofer's Olaf Korte states that Digital Radio Mondiale still lacks affordable mass-market receivers. He added that the use of DRM in mass markets like Russia and China would help to solve that issue.

In this country, shortwave broadcasters are restricted from transmitting to listeners within the United States. It would be interesting to see if successful results make the case to change that rule, one observer noted, because such a service could help "under radioed" populations, like Alaska's.

And going even further, could successful results lead one day to testing DRM on the AM band here, considered by some to be a logical choice to challenge IBOC?

Sources said no, that circumstances surrounding this test are so unique they don't support that extrapolation.

See related story, page 3.

# DRM

► Continued from page 3

depend largely on shortwave.

"Without trying to minimize the value this has to Alaska," he said, "this is transportable to other places in the U.S. Just think about — if I can use the phrase — the 'red states' in the United States. A lot of them are sparsely populated — the Dakotas, Montana, up and down the Rocky Mountain area."

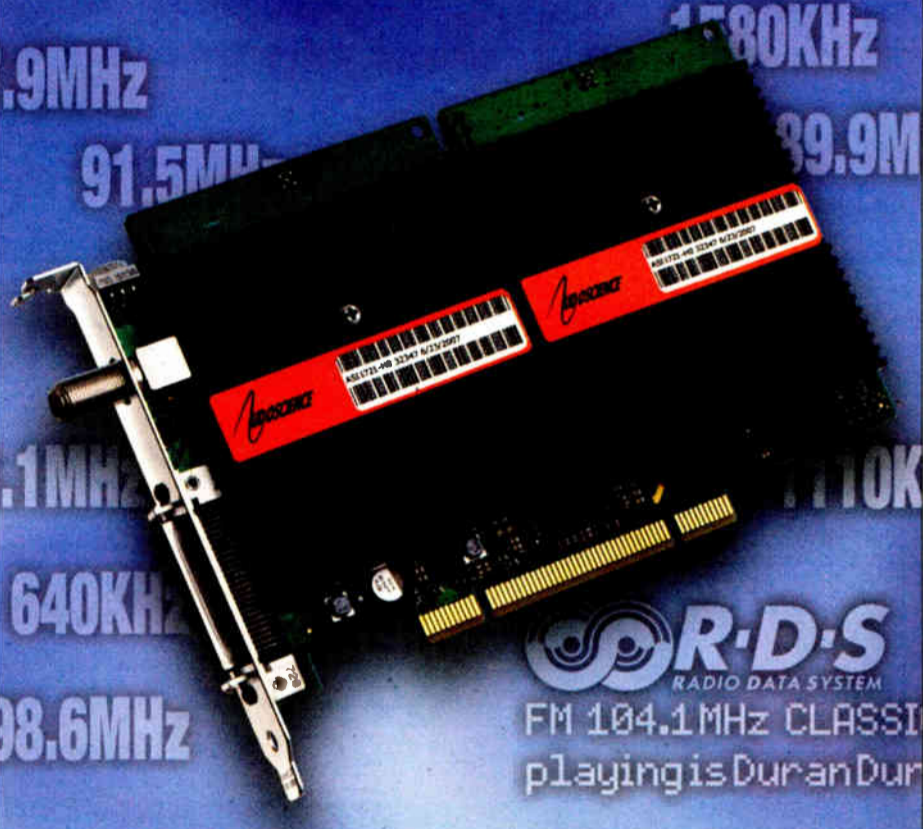
## SW to U.S.

The final category of DRM on shortwave is "traditional" shortwave for long-distance skywave coverage, but aimed at a domestic audience.

Messer said TCI International did some research showing that five transmitters could cover the U.S. with a DRM signal "at power levels that are consistently lower than what you're used to." He said it remains to be seen if existing shortwave stations in the United States or other commercial concerns will show an interest in the possibility of domestic HF broadcasting.

As for the U.S. government, "The IBB is prohibited from doing this, but I can tell you there is some interest in trying to

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# EAS

► Continued from page 1

believe that deadline is far into the future.

Experts say CAP is just one of several concepts being considered by FEMA, but the most likely to be chosen.

An EAS "summit" hosted by the FCC in May left many in the broadcast community dissatisfied with FEMA's progress and vociferous in urging that agency to move forward on EAS with purpose.

Monumental changes are coming to EAS, and FEMA officials say they are doing their best to assemble the multiple layers and parts, including cellular alerts via the Commercial Mobile Alert System, which also features FEMA in the prime development role.

Despite the size of the undertaking, some in broadcasting say it is imperative that FEMA takes definitive steps this year towards CAP implementation.

"FEMA needs to lead or get out of the way," said Art Botterell, an architect of CAP Version 1.1, which is already being used by some states for emergency warning.

"Regrettably, FEMA doesn't appear to have anyone on staff who knows or cares about state or local warning. They have so far ignored the thousands of alerts everywhere from NOAA, AMBER and other local sources."

Botterell, manager of a community warning system for the Sheriff's Department of Contra Costa County in California, feels FEMA is too concentrated on a "doomsday national alert" scenario and is ignoring the wishes of state and local emergency managers.

He is recommending it implement CAP in two phases. A simple introduction of CAP-based messaging using the current EAS Specific Area Message Encoder (SAME) infrastructure should

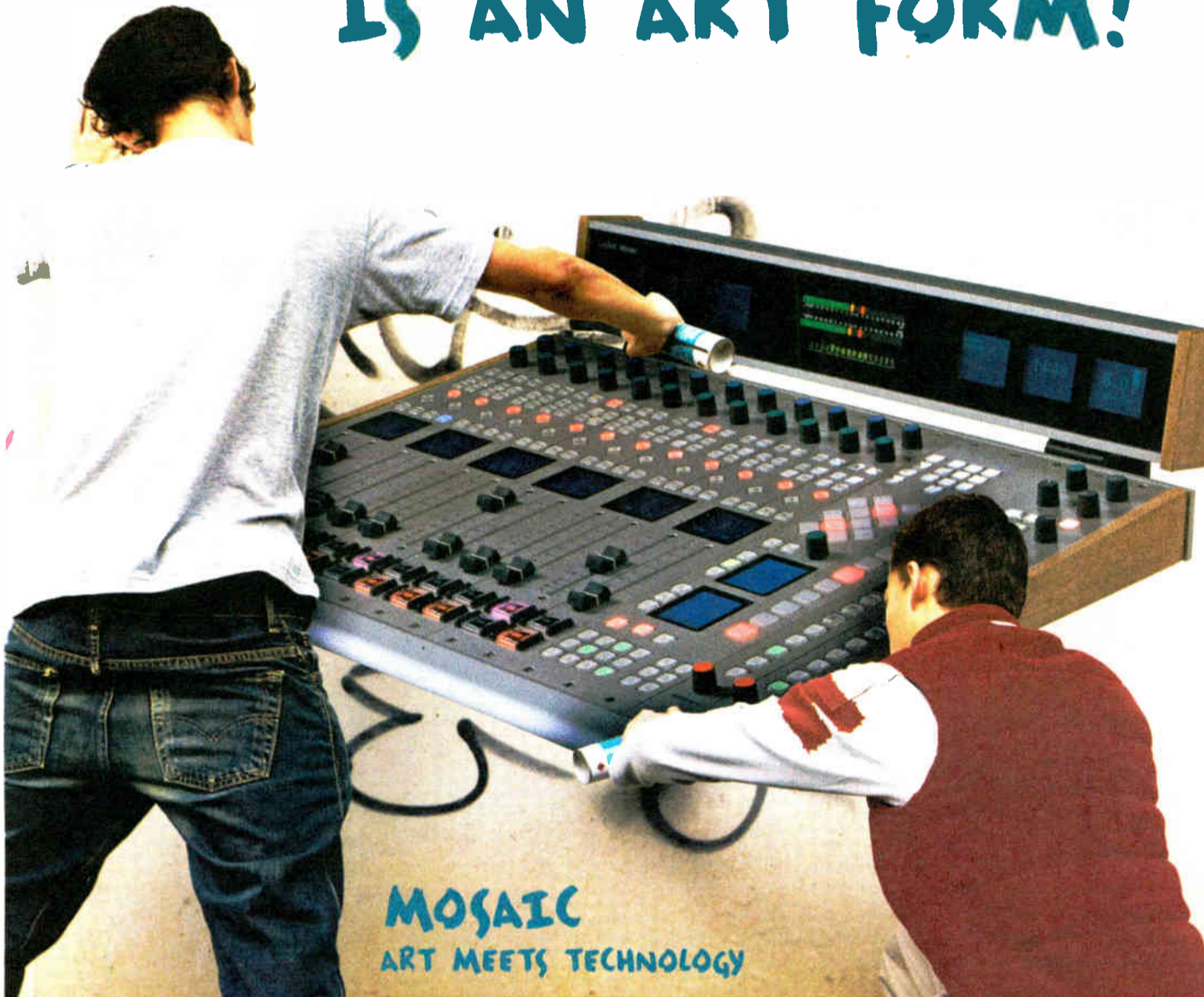
come first. "Then you incorporate all of the advanced features CAP messaging is capable of," Botterell said.

FEMA says it is moving slowly so as to accommodate all elements of the new



Ann Arnold, chair of the Texas State Emergency Communications Committee and executive director of the Texas Association of Broadcasters, left, and Dale Gehman, president of Gehman Compliance & Consulting, speak at the EAS 'summit.'

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system and because it wants to develop an approach that really works. The goal is an inclusive, interoperable system, they say.

The Society of Broadcast Engineers has offered FEMA help, saying it is willing, if asked, to form working groups to develop a strategy to implement CAP.

Others within the EAS community believe FEMA is being "locked in" by policy battles that have resulted in no measurable progress in the advancement of public warning since 9/11.

**We are very sensitive  
to our decision  
making on CAP.  
We want to make  
sure this is a  
collaborative effort.**

— Lance Craver, FEMA

"At this point I would be surprised to see any action from FEMA in implementing CAP within the next two years," said Dale Gehman, president of Gehman Compliance and Consulting, a firm that specializes in emergency warning systems consulting.

### Funding & training

Gary Timm, broadcast chair of the Wisconsin EAS Committee, said, "Next-gen EAS will require federal leadership, funding and training for emergency managers to properly originate CAP messages and for SECCs [State Emergency Communications Committees] to properly build new networks to distribute CAP alerts."

FEMA, which has yet to release CAP-to-EAS specs, was designated as the lead federal agency by President Bush to develop new methodology for public warning in this country.

Specifically, FEMA's Integrated Public Alert and Warning System is viewed as the integration vehicle to bring disparate warning systems under one protocol.

FEMA walks a delicate line of creating a framework that ensures a successful transition to the next generation of EAS, said Lance Craver, program manager of IPAWS.

"We continue to move forward on standardization. We have lots of moving parts with IPAWS. I need to build out the architecture, we need certification, we need to test it and we need grant funding," he said.

See EAS, page 8 ►



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# EAS

► Continued from page 6

FEMA managers view IPAWS as the national design for integrating all public warning assets. "It is the architecture that would enable competitive vendors to offer an interoperable interface to their products, which allows for them to be mixed and matched," said one EAS expert.

FEMA's goal is to take advantage of new technology that gives IPAWS the ability to generate public warnings on cell phones, pagers and computers.

In June, FEMA announced it would play the role of aggregator/gateway for commercial cellular alerts after earlier saying it lacked authority to do so.

"There are a whole host of things we need to coordinate. We are working within multiple industries to make sure that happens," Craver said.

As for adoption of CAP, he said, "We are very sensitive to our decision-making on CAP. We want to make sure this is a collaborative effort."

That includes working with the FCC and the National Oceanic and Atmospheric Administration, Craver said, to strengthen those relationships. "We want to do things smartly, innovatively and economically."

As for criticism that FEMA is moving too slowly, Craver said, "From the outside it may look that way. I think we are moving quickly and making good progress. We will be announcing new details within months."

The cost of training emergency managers on CAP protocol and a new EAS could be covered by federal grant money, Craver said.

The FCC believes funding resources are key to maintaining EAS readiness, including money directed to training state and local alert officials.

"Training of such personnel is essen-

statement about what they are doing. The broadcast industry needs to know what (FEMA) is working towards and what they are building.

"The worse-case scenario is they come back to us in a year and say, 'This is what we've built,' and it's something that requires massive new equipment expenditures."

**Can the current five to six equipment manufacturers of encoders and decoders design, build, test and deliver 5,000 units each in what would likely be about a six-month period?**

— Darryl Parker, TFT

tial to prevent system mis-feeds and failure. A more robust federal commitment to training programs is desired by many within EAS alerting," a commission spokesman said.

FEMA estimates initial training of emergency managers and broadcasters on a new national EAS would be approximately \$1.5 million to \$3 million.

For its part, the National Association of Broadcasters, on the record supporting the CAP standard for EAS, is more worried about "what was not said" at the May meeting, said Kelly Williams, NAB senior director of engineering.

"FEMA has yet to give a definitive

If FEMA goes with CAP, several equipment manufacturers already offer equipment for sale capable of receiving CAP 1.1 messages, including TFT Inc. and Sage Alerting Systems.

Several observers said FEMA's selection of a standard should be open and non-proprietary, even though its agreements with contractors probably restrict what it can discuss through the selection process.

According to several experts, FEMA is relying on a number of contractors to determine the future of IPAWS and CAP. Those contractors include Sandia National Laboratories, which develops science-based technologies. Sandia Labs is a government-owned contractor that is managed by Sandia Corp., a Lockheed Martin company.

### Broadcast role critical

"There still lurks a danger of FEMA adopting technical standards for a new system that will take years to deploy and be fraught with ill-conceived notions and regulations," said Darryl Parker, senior vice president of TFT Inc.

"Now that it appears that user groups and manufacturers are picking up the pace, we will be closer to having a workable, reliable and open system."

The 180-day clock for broadcasters to adopt a new standard may also be too short, Parker said.

"There are 30,000 EAS participants. Can the current five to six equipment

## PEP Station Expansion

FEMA has announced plans to expand the number of stations in the Primary Entry Point system from 34 to more than 60. PEP is the means by which the president could address the country during a national emergency.

"The move was necessitated by shifting demographics of the nation," said Lance Craver, program manager of IPAWS. "We need to reach 85 percent of the nation's population within 10 minutes for an Emergency Action Notification. FEMA is responsible for doing this. We will assemble the infrastructure to do that and states and locals can then use it as well."

Craver said he expects to begin a two-year building plan to complete the expansion later this year.

FEMA also announced at the April NAB Show that Digital EAS, a network designed to deliver EANs via a digital data channel on PBS HDTV stations, eventually will be made available to individual states to distribute state emergency messages.

manufacturers of encoders and decoders design, build, test and deliver 5,000 units each in what would likely be about a six-month period?" Parker asked rhetorically.

Regardless of how quickly FEMA moves on adopting a new standard for next-gen EAS, many within the EAS community believe broadcasters will still play a critical role in public warning in this country.

"Everyone gets excited about cell phone alerting and text messaging, but that is likely to only be voluntary in nature. We as broadcasters still can effectively blast a message out to a lot of people in a short amount of time," said Suzanne Goucher, chair of the Maine SECC and president of the Maine Association of Broadcasters.

Craver said the broadcast industry has always been the backbone of emergency alerting, from its infancy as CONELRAD, then through EBS and now EAS. He doesn't expect that to change as a result of FEMA's actions.

"We look forward to partnering with [broadcasters]. We need the key players and to partner smartly. We will reach out to them," Craver said. ●

## Newswatch

► Continued from page 2

creditors. The Maryland-based satellite radio firm hopes to build a commercially viable mobile satellite service in Europe. It signed agreements with four holders of bridge loan notes and convertible notes. The creditors agreed to defer until the end of June an obligation to pay \$17.7 million in principal plus accrued interest "and to forbear exercising their rights and remedies with respect to the payment default." Chairman/CEO Noah Samara said this gave the company time to raise more money.

**AUDEMAT, AEQ:** AEQ and Audemat — based in Spain and France respectively, but with sales operations elsewhere, including a U.S. presence — announced a sales alliance for specific projects. The companies said they would take advantage of synergies in terms of market, product

focus and scope. AEQ will promote Audemat products to specific Portuguese and Spanish clients while Audemat will promote AEQ products to areas and customers in France. Both engineering/project departments will be able to offer solutions for radio studios and transmitter sites in Africa, South America, Asia and the Middle Eastern regions, the firms said.

**KRKO OKAY:** The Federal Communications Commission approved the application of KRKO(AM) in Everett, Wash., to build four towers to help boost its 1380 kHz signal from 5 kW to 34 kW during the day and 50 kW at night. For years, opponents cited numerous reasons to block the project, including a potential threat to migratory birds, lower property values and the specter of cancer from RF radiation exposure. In June, the FCC said it was satisfied. President/GM Andy Skotland hopes to have the towers operational this year.

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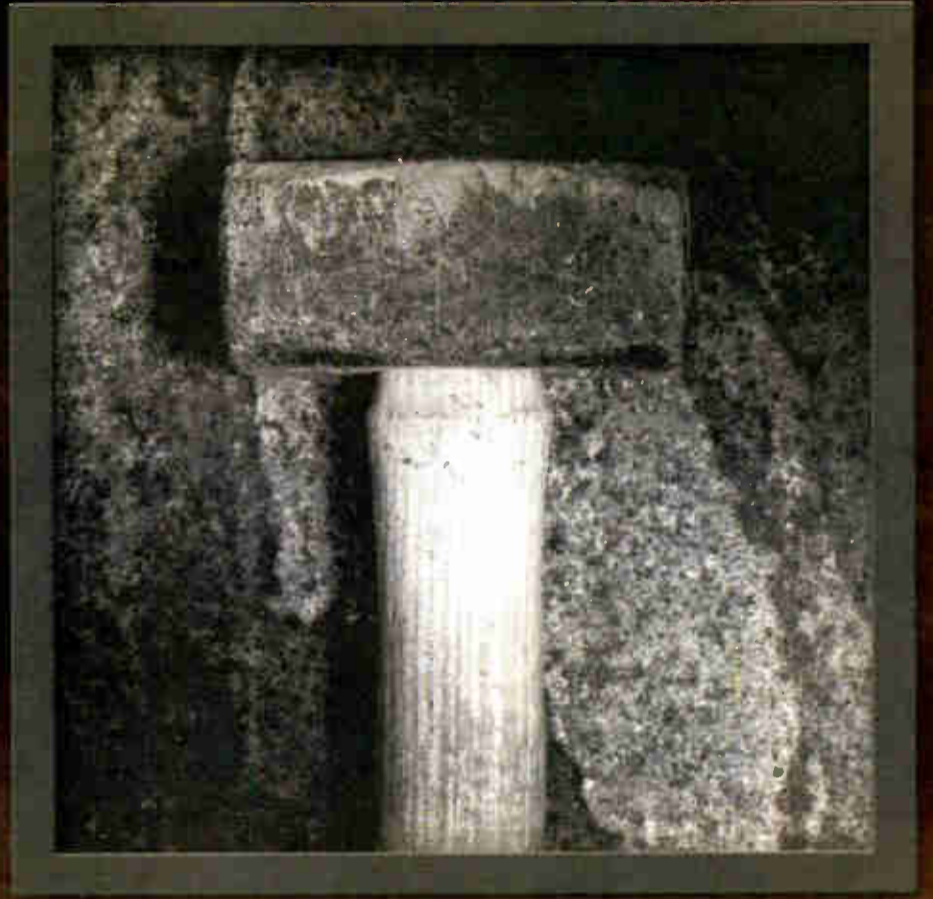
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World Radio History

## A DVR Sentry Watches Your Site

by John Bisset

Gary Kline, Cumulus VP of engineering, passed along pictures of work his Houston market engineers did to harden their transmitter sites.

Robbie Green is the IT manager for Cumulus Houston. He points out that in Fig. 1, the security cameras almost look like spotlights. To the uninitiated, a daytime visit would be caught on camera.

Robbie and his crew went a step further. When choosing cameras, they bought models capable of night vision. Next was the purchase of a DVR that records inputs from both cameras. The DVR is capable of e-mailing a message whenever it detects motion. The e-mail will include a still image of the motion that triggered it.

Should something suspicious take place, the video cameras can be accessed remotely and in real time.

Robbie and his staff also added a new security light out front. It's motion-triggered, only at night.

Fig. 2 shows two DVR images of someone at the front door. No, it's not a copper thief, it's Cumulus Engineer John Whiteside. He's installing one of the super-secure locks, seen in Fig. 3.

Robbie adds to bring your blowtorch if you forget the keys — no one is getting past those doors.

Great ideas to keep sites safe. Robbie Green can be reached at [robbie.green@cumulus.com](mailto:robbie.green@cumulus.com).

\*\*\*

Here's a neat Web site for cleaning up. Click on <http://lafreshgroup.com> and take a look at their Tech Pack.

The La Fresh Group packages a variety of cleaning products. See FRESH, page 12 ▶



Fig. 1: Security cameras watch over a site

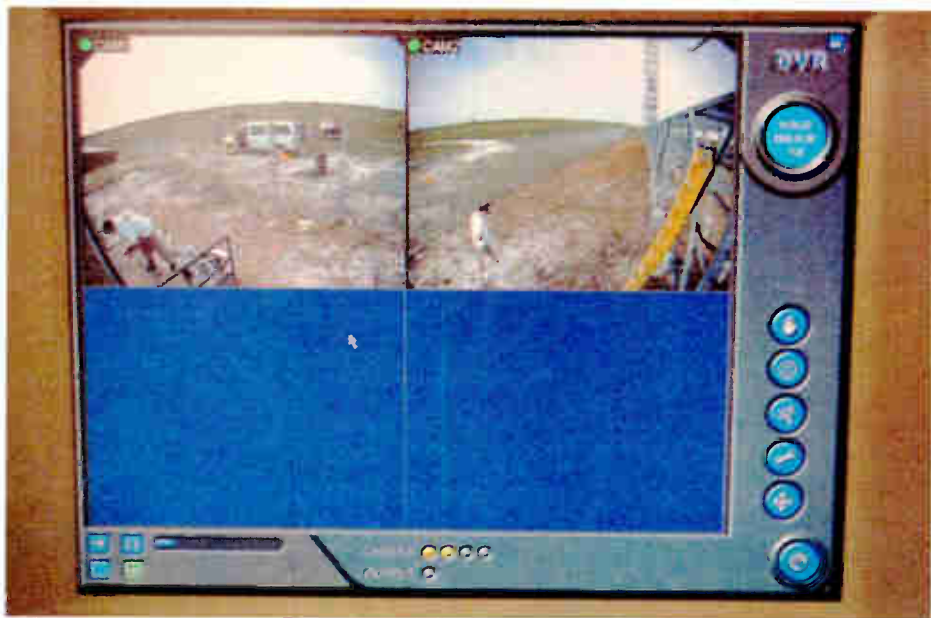


Fig. 2: The DVR will not only store images but e-mail them as well.



Fig. 3: No one's getting through these doors easily!



Fig. 4: Keep electronics clean and working well with these wipes from La Fresh.

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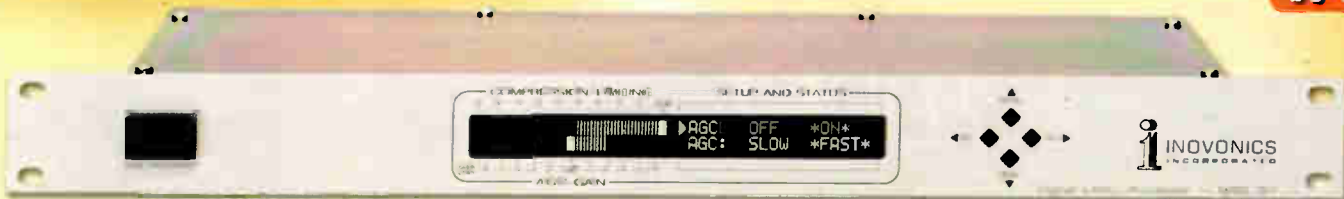
The 261 can tame a mic channel, normalize levels between

music and voice tracks, protect an STL, and give yeoman's service as a standalone LPFM processor. Basic processing parameters are adjustable through quick and easy menu-driven setup, yet not to an extent that will ever get you into trouble. The 261 just can't be made to sound bad.

The 261 accepts analog or digital inputs, and both analog and digital outputs are available simultaneously. Its

straightforward DSP design uses processing algorithms that are sonically colorless. Front-panel alarms and rear-panel tallies give warnings of dead-air and out-of-limits operation, and firmware updates are easily installed in the field.

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World Radio History

# Survival in a More Competitive World

*Radio May Have Gotten a Little Flabby Lately, But It's Not Dead Yet*

With apologies to Monty Python, radio's not dead yet. It may be premature to conduct a post-mortem on broadcast radio.

But it is worthwhile to consider how the medium might fare in a new digital world. In fact, as my industry colleague Glynn Walden has recently pointed out, after Feb. 19, 2009, radio will be the sole remaining *analog* mass medium in the United States.

Of course, it is *not* the only traditional medium facing new competition. Examining radio's fate vs. that of others in similar straits can provide some interesting insights.

## Compared to what

Consider over-the-air (OTA, i.e., local, terrestrial) broadcast television, which was once the nation's only form of video content delivery, but has since faced competition from VCRs, DVDs, cable and satellite TV.

The latter two sectors have added hundreds of directly competitive new channels onto the same platform that most U.S. consumers now use to receive their local broadcast TV channels.

(About 85 percent of U.S. households subscribe to either cable or satellite TV. Even more of them may do so after the February analog TV shutdown, since if they only get OTA TV today, they'll have to do *something* to keep receiving it after that date, and some of them may use that opportunity to finally take the plunge for cable or satellite service — but I digress.)

The important item to note is how big a share most OTA-TV channels still hold in the cable/sat-TV environment.

They typically maintain audience levels that are highly disproportionate compared to the number of new competitive channels added alongside them by cable and satellite providers.

Their shares are not what they once were, of course, but it is a rare occurrence when any other cable/sat-TV channel draws a larger audience than the major commercial-network affiliated local broadcast channels.

Yet that rarity has begun to happen with somewhat increasing frequency of late. Moreover, the *aggregate* drain of a large number of non-premium cable channels that are all growing their audiences (e.g., Bravo, A&E, ESPN, TLC, Comedy Central, et. al.) has had increasing impact.

So cable/satellite TV continues to cause a slow leak on OTA TV broadcasters' fortunes.

(Note that OTA public TV has been hardest hit here, by numerous narrowcast channels presenting the more specialized content types of which PTV used to be the sole provider, like educational, children's, cooking and documentary programming.)

On the other hand, satellite *radio* currently only serves about 5 percent of the U.S. population — a far cry from the large majority served by cable and satellite TV.

Although there are no "must-carry" rules for satellite radio, in most cases it presents its additional content right alongside OTA radio on the same platform — an AM+FM+Satellite radio tuner — effec-

tively just like cable/sat-TV does. (There are some satellite radio receivers *without* AM/FM tuners in handheld form factors, but these are found among an even smaller minority of the national audience.)

Most interesting, however, is research data from Arbitron, which indicate that

**Research data indicate that satellite radio-equipped listeners remain loyal OTA radio users.**

even these satellite radio-equipped listeners remain loyal OTA radio users.

Among satellite radio owners that Arbitron recently polled, 42 percent of their radio listening was to OTA radio, compared to 33 percent for satellite-channel listening. (The remaining 25 percent was mostly devoted to Internet radio — more on this below.)

Satellite radio owners were also found to be radio fanatics overall, spending an average of 30 hours per week listening to all forms of radio, compared with the national average of 19 hours per week.

## Fresh

► Continued from page 10

ety of cleaning accessories; this pack is a collection of three types of road-tested products to assist with cleaning digital gadgets; it costs \$9.99 a pack.

Inside you will find both wet and dry screen cleaning towelettes, anti-bacterial towelettes and lens cleaning towelettes. Similar in size to the wet-naps you get at a good BBQ place, the towelettes are ideal for keeping computers, cameras, even cell phones clean and dirt free.

By the way, golfers should note there's even a Golf Pack.

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★ ★ ★

Wes Boyd, market engineer for Cumulus Youngstown, often passes along useful tips for *Workbench* readers.

He's done it again with news of TinyCAD. This is an open-source schematic capture program for Windows, available for free from Source Forge.

The program helps you draw circuit diagrams and comes complete with symbol libraries to get you started. In addition to being able to simply print your designs, you can use TinyCAD to publish your drawings by copying and pasting into a Word document, or saving as a PNG bitmap for the Web.

You can also use TinyCAD as a front end to a PCB layout program (see the links), by getting TinyCAD to create a netlist of your circuit.

TinyCAD is open-source so you can use it for free, and you can download the source code for use in your own projects. Here's the link: <http://tinycad.sourceforge.net/>

For help and support, go to the Yahoo! group called TinyCAD. In this group you can talk to other TinyCAD users. It's an excellent place to start if you are new to

So satellite radio may not be the Death Star for OTA radio after all, and in fact could be actually *stimulating* OTA radio listening.

The proposed merger of the two satellite radio operators would likely have no significant effect on those OTA listening rates, by the way. It might even improve the situation for OTA radio by ultimately creating less choice in satellite offerings

## The Big Picture



Photo: Garry Hayes, BBC

by Skip Pizzi

have abandoned marginal formats like classical, jazz, AAA and in-depth news. The audiences thus inherited have made public radio the strongest audience-growth sector in U.S. radio over recent years.

In summary, both commercial and public radio broadcasters have fared pretty well so far against this first wave of new digital competitors.

And by the way, in case you didn't notice, I haven't even mentioned IBOC here. It's not really a factor in this fight — not yet, at least.

Perhaps it will become another arrow in the quiver down the road (particular given multicasting and datacasting capacity), but for now, OTA radio is holding its own against digital competition almost exclusively via its *analog* infrastructure.

It appears the first wave of the digital See ALIVE, page 16 ►

through consolidation of similar channels, and possibly inflicting more regulatory constraints on the merged (i.e., monopoly) entity, thus inhibiting its future ability to innovate against competitors.

In a further footnote, public radio has had just the opposite experience from public TV in this new competitive landscape, as we've noted before.

Rather than giving up ground to new niche competitors like public TV, public radio has *gained* new arenas in which to excel, as its commercial radio competitors

the program.

Thanks, Wes, for a useful — and free — tip that will help everyone become more productive.

Wes Boyd can be reached at [wboyd@theradiocenter.com](mailto:wboyd@theradiocenter.com).

★ ★ ★

Stantron, a division of Mayville Products Corp., has introduced a new product, the Glide and Turn Equipment Rack.

Shown in Fig. 5, the rack features all-steel construction and is designed to fit into a wall or closet.

The upper part of the rack slides out and can be rotated to reach the back of the rack for access to connectors or

cabling. The rack design keeps equipment hidden from sight, yet provides complete access for maintenance. The Glide and Turn rack is available in sizes from 10RU to 30RU.

For information, go to [www.stantron-racks.com](http://www.stantron-racks.com).

John Bisset has worked as a chief engineer and contract engineer for 39 years. He is the northeast regional sales manager for Broadcast Electronics and in 2007 received the SBE's Educator of the Year Award. Reach him at (571) 217-9386 or [jbisset@bdcast.com](mailto:jbisset@bdcast.com). Faxed submissions can be sent to (603) 472-4944.

Submissions for this column are encouraged and qualify for SBE recertification credit. 🌐



Fig. 5: Easy access to the back of equipment is provided in this Glide and Turn rack.

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World Radio History

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# NWPR Nears Completion of HD-R Rollout

by Paul McLane

Northwest Public Radio has replaced eight of its analog transmitters with HD Radio units in the past year or so; they are FM stations KMWS Mt. Vernon, KNWY Yakima, KNWR Ellensburg/Wenatchee, KLWS Moses Lake, KFAE Richland, KRFA Moscow, Idaho, and KZAZ Bellingham, as well as AM station KWSU Pullman.

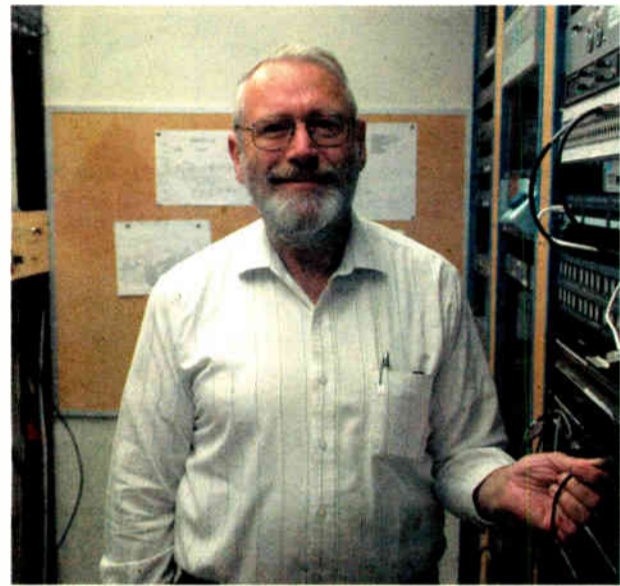
Transmitters in three more locations — Port Angeles, Walla Walla and Clarkston — are scheduled for replacement in the next year.

RW talked with Dave Brawdy, CPBE, chief telecommunications engineer for Washington State University, about the \$1.9 million, grant-supported HD Radio project.

**RW:** Describe your organization and this project.

**Brawdy:** The original station in our network and among the first radio stations in the country, KWSU(AM), signed on as KFAE(AM) on Dec. 10, 1922, and later spent many decades as KWSC.

Edward R. Murrow first used a microphone at the station in the late 1920s, as did sportscaster Keith Jackson in



Dave Brawdy

the 1950s and ABC journalist Barry Serafin in the 1960s.

Today, KWSU serves the Palouse and Clearwater Valley area of southeastern Washington and northern Idaho. Studios are in Pullman in the Murrow Communication Center of Washington State University.

WSU's Educational and Public Media department operates Northwest Public Radio and Northwest Public Television. NWPR is a 13-station network; it is also carried on 12 translators in Washington, Oregon and Idaho.

## Alive

► Continued from page 12

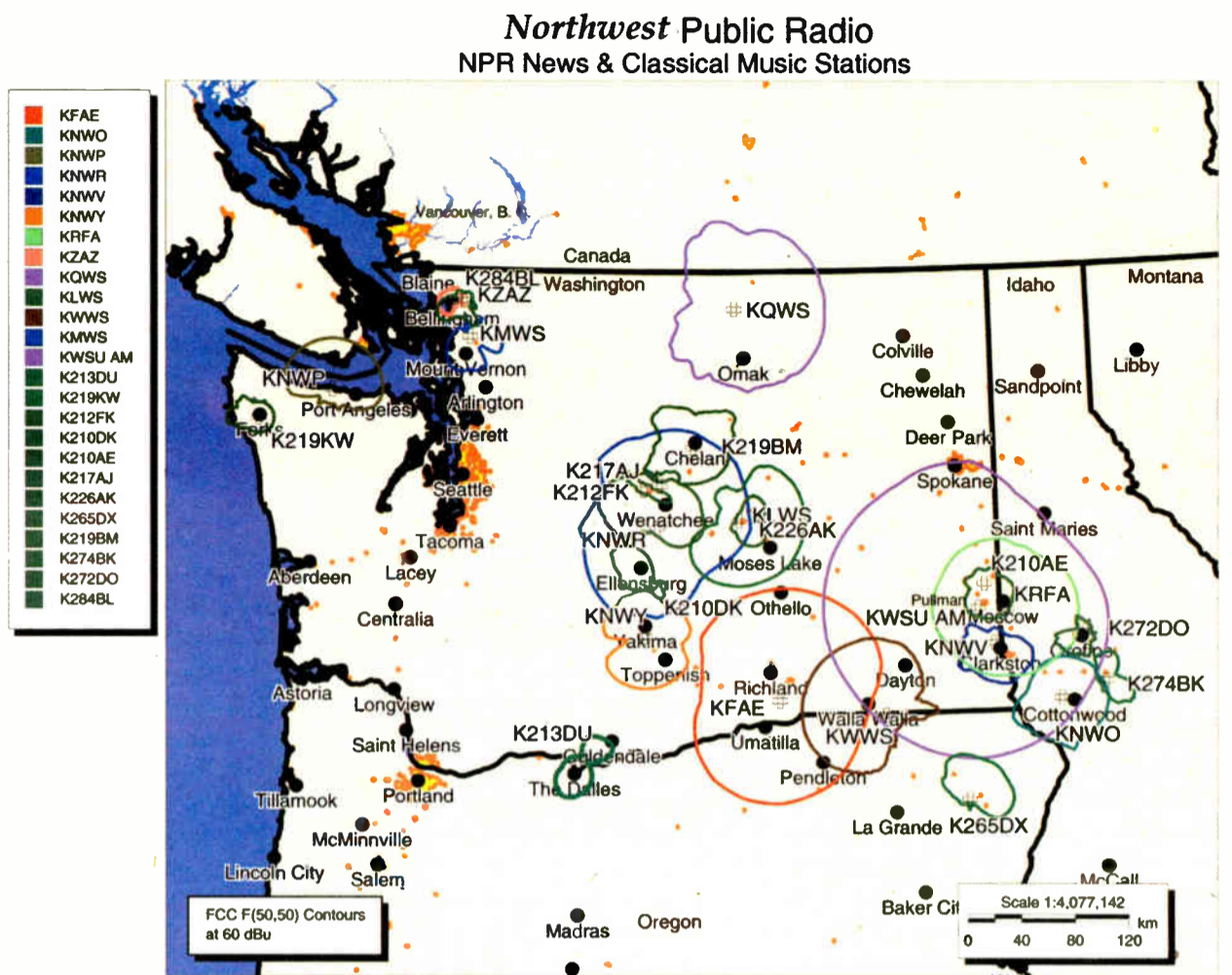
broadcasting battle is at stasis, having now reached a certain level of maturity. The *real* new competition that both radio and TV are worried about next is high-speed Internet. (For radio this applies more specifically to the *wireless* broadband Internet, which has yet to be widely deployed.)

### Competition 2.0

The Internet is a very different — almost diametrically opposed — competitive environment, however.

Here, instead of broadcasters facing a few, monolithically large and well-funded commercial competitors trying to beat them at their own game as described above, this new online "competitive threat" is actually an open platform — almost a historical accident — that incumbents and upstarts alike can join with equal ease.

Broadcasters have a major advantage, though, in that they can use their legacy "push" platforms as development and promotional springboards for the "pull" environment of the Internet, thereby driving existing, local listeners to their online offerings, then adding Internet-



Map of the network.

The NPR and Classical Music service is carried on eight of our stations. A second program service, our NPR News service, is carried on five; this service provides a full schedule of NPR news and talk programs.

NWPR moved its satellite uplink capabilities from Pullman to Colorado Public Radio in Denver in 2005. This cooperative venture allows NWPR to take advantage of CPR's satellite delivery system, which has store-and-forward features that enable each of the NWPR stations to provide localized announcements, weather reports and underwriting using International Communications Products satellite receivers at each receive site.

There are still two stations (as well as all translators) that receive programming by analog off-air receivers. One of these transmitters, KNWV, will be fed via a new T-1 circuit using Harris Intraplex equipment when it is upgraded to HD Radio.

The ICP satellite receivers have an internal hard drive for storage of downloaded audio, which can be individually addressed and played out by the automation system. The receivers also have the capability of providing two separate program outputs, so both of the NWPR program streams are available at each site. This has allowed us to add one multicast channel at each transmitter.

Individual importers and exporters had to be purchased for most of the transmitters because of the need to do localized announcements. If there were not a requirement, two sets of importers and exporters could be installed at the uplink to feed all of our HD transmitters.

In the future, if Ibiqity provides a local store-and-forward capability in the importers and exporters that is compatible with our needs, our system could be reconfigured.

See NWPR, page 18 ►

only, local and non-local users.

Although costs factors differ, some radio stations' total Internet audiences could eventually be as large or larger than their local OTA numbers. (Remember, however, that this advantage applies similarly to *all* broadcasters, not just OTA. Many cable TV and satellite TV/radio services have already invested heavily in their online presence.)

Perhaps the biggest difference facing broadcasters is that Digital Competition 1.0 was essentially one-way, point-to-multipoint service, just like OTA. Meanwhile, Competition 2.0 is another animal entirely, given the inherent interactivity of its two-way, point-to-point connections.

Here too, however, radio holds an advantage.

In the TV world, the boundary between these competitive environments is blurred because the digital TV aggregators (particularly digital cable) are also broadband Internet service providers, so the aggregators benefit either way. This makes OTA TV channels even more like pure content contributors, despite their recent (and mandated) investments in OTA digital delivery systems.

(Perhaps the Mobile DTV standard currently under development will allow OTA DTV to bear more of its own fruit someday.)

Further, both cable and satellite TV increasingly provide

(non-OTA-TV related) on-demand content and other bidirectional services to their television customers.


Radio has no such crossover effect — the border between satellite and Internet radio is clearly defined, both functionally and business-wise. Radio broadcast (OTA and satellite) is exclusively a licensed, one-way world, and Internet radio is an unlicensed and open, two-way environment.

The distinction is straightforward here, although this doesn't make the Internet any easier to cope with — like OTA, there are *more* Internet radio services than Internet TV sources, and this will likely always be true.

Again, the Internet radio world includes both OTA and satellite radio companies (worldwide) that are putting their services online, plus the myriad Internet-only providers, creating a far noisier marketplace than the AM/FM dial could ever be.

Broadcasters need to adapt to all of this new reality if they hope to survive. New players and new rules call for new strategies.

Broadcasters must also become accustomed to fighting on multiple simultaneous fronts (ever play 3-D chess?), continuing to play defense against the first competitive wave, while launching a new offense in the second. It's becoming a whole different game out there.

Skip Pizzi is contributing editor of Radio World. 



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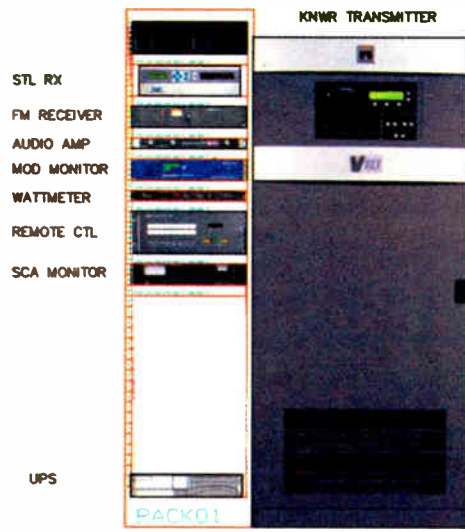
# NWPR

► Continued from page 16

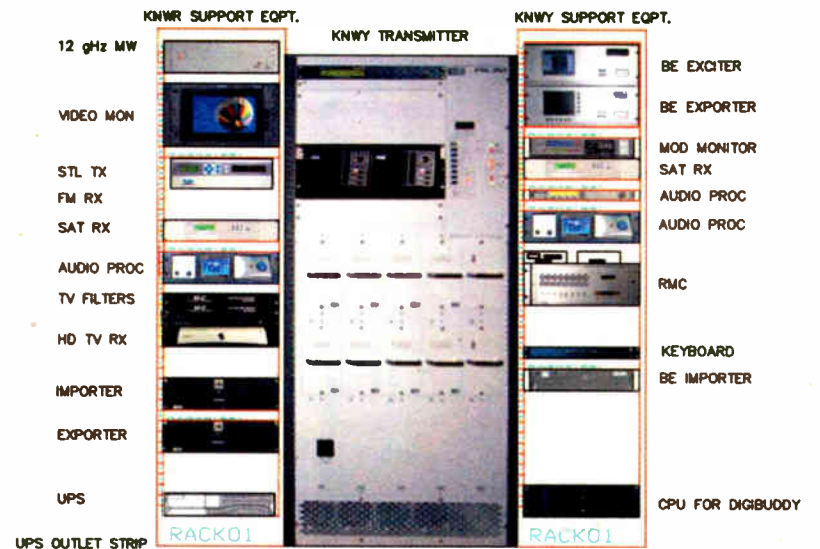
Live segments originate in Pullman and are transported to CPR's uplink facility via a dedicated T-1 circuit using Harris Intraplex equipment. A backup ISDN circuit is available when the T-1 circuit fails. For non-live programming, all music and satellite feeds originate in Denver.

Three of our transmitters, KNWR, KRFA and KNWV, will have the importers and exporters installed at a separate location and connected via microwave.

At KNWR, the site on Naneum Ridge is difficult to access, especially in the winter, and I felt the system would be more reliable and easier to maintain if the components were separated. KRFA and KNWV will have their shared importer and exporter installed at the NWPR studios in Pullman since they broadcast identical programming.



KRFA NANEUM RIDGE TRANSMITTER SITE



KNWV AHTANEUM RIDGE TRANSMITTER SITE YAKIMA

Rack layout drawing for both ends of the KNWR installation. Brawdy creates rack and interconnect drawings for each site. 'If electrical work such as a new generator or building construction is required, I also produce AutoCAD drawings for these parts of the installation.'



East Area Supervisor Tom Saylor prepares to make a trip to the KRFA transmitter site during installation.

**RW:** What is the most interesting thing you've found about these installations?

**Brawdy:** A transmitter is much more than an RF box anymore. Along with the

basic RF hardware, CPU based exciters, importers, exporters, remote controls, modulation monitors, audio processors and even Wattmeters are used, and one needs

to become familiar with the software and setup for each of these components.

This adds a degree of complexity to the hilltop, but also enables expanded capabilities and opportunities.

I am concerned about the long-term life and reliability of these components. Instead of a 20+ year transmitter life, are we now looking at just five years instead?

**RW:** What is your multicasting/HD2 strategy, if any?

**Brawdy:** Multicasting allows us to offer both of our program services in a community without having to license and construct a second transmitter. Because I purchased importers with two-channel capability, a third program service can be added in the future, and we are exploring this option.

**RW:** Assess how well HD Radio is working for the organization to date.

**Brawdy:** Until all of our stations are upgraded to HD, we haven't promoted the technology.

For some stations the HD coverage is surprising, given the low actual digital transmitted power. In some areas the coverage is somewhat disappointing. I

would like to see the FCC allow a higher digital ERP.

**RW:** Other lessons learned?

**Brawdy:** The HD-FM technology is still quite young and is constantly changing. Support and monitoring equipment is being upgraded, improved and, unfortunately, being outdated rapidly. Buying equipment that cannot be easily updated as the FCC and Iqibity make changes is shortsighted.

When collocating at a cell tower site, normal installation costs can be many times higher than those at our other broadcast sites. Some cell site owners require that only their certified contractors be used for anything and others require the use of their staff at several times the normal cost.

NWPR stations are using new Broadcast Electronics and Nautek transmitters; two STLs were replaced with Moseley Starlink 950 equipment. Stations are using Audemat Goldeneagle or DaySequerra HD mod monitors; and the organization has applied for a grant to implement Burk IP-based remote controls. KWSU(AM) also added a new Kintronic ATU.

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## Band Scanner Pro

The Band Scanner is a tool to evaluate FM broadcast band congestion and to log station identification parameters. The system is powered by the USB port of any Windows PC. Supplied free of charge Windows software sweeps the receiver across the FM band, logging every carrier and generating a spectrum display of carrier level vs. frequency. It then analyzes each carrier and creates a station list. Stations with an RDS presence are further refined to show all the radio data groups being transmitted. Its interface is like a portable radio: It may be tuned manually through the receiver screen or by double-clicking a point on the spectrum plot or an entry on the station list. Spectrum plots may be saved as jpg or bmp files. The RDS data error level is graphed in a separate window on the receiver screen. The program can be monitored with headphones plugged into a standard 1/8" jack.

## First Trans-Atlantic Broadcast, Other Gems Are Now in National Recording Registry

Several radio milestones are now part of the National Recording Registry.

The Librarian of Congress identifies such a list each year, by law, to help preserve the country's aural history.

The library also is identifying and preserving the best existing versions of these recordings; they will be housed in its new preservation facility in Culpeper, Va.

Librarian James H. Billington stated, "Audio preservation constitutes a critical challenge. Much has already been lost, particularly in the field of radio."

Here are excerpts from the descriptions:

**The First Trans-Atlantic Broadcast (March 14, 1925)** — Representing a technological breakthrough, this early orchestral broadcast originated in London, traveled by land line to station 5XX in Chelmsford, crossed the Atlantic where it was picked up by an RCA transmitter in Maine, and relayed to stations WJZ in New York and WRC in Washington, D.C. Although the fidelity is low, the recording is significant as a docu-

**Audio preservation constitutes a critical challenge. Much has already been lost, particularly in the field of radio.**

— The Librarian of Congress

mentation of a technical achievement and a very rare instance of an extant example of a complete radio broadcast of the 1920s. The entire 37-minute broadcast survives on discs in the collections of the University of Maryland's Library of American Broadcasting.

**Fibber's Closet Opens for the First Time, "Fibber McGee and Molly" radio program (March 4, 1940)** — The hall closet at 79 Wistful Vista, home of Fibber McGee and Molly (played by Jim and Marion Jordan) was the source of one of radio's most successful running gags and America's best-known pile of junk. The effect played on the strength of the sound medium.

Frank Pittman, the program's sound-effects engineer, created the comic catastrophe. The initial click of the door latch tantalizingly opened the routine. Then the thump of several boxes hitting the floor followed and grew to a crescendo of falling bric-a-brac increasing in speed and intensity until the victim was buried under a mountain of pots, pans, fish poles, dumbbells, skates, pie pans and coffee pots. The coda of the avalanche was the tinkling of a little bell.

**"Wings Over Jordan," Wings Over Jordan (1941)** — The Wings Over Jordan choir was founded in 1935 by Rev. Glenn T. Settle, pastor of the Gethsemane Baptist Church in Cleveland, Ohio. In 1937, they began appearing on the radio program, "The Negro Hour," singing spir-

ituals and other traditional gospel songs on local station WGAR. By 1938, the choir had become nationally known, broadcasting on CBS. The show, renamed "Wings Over Jordan," featured prominent African-American artists and scholars as well as choir selections. It ran until 1947. Many of these radio programs can be studied and appreciated today because they were pressed as electrical transcriptions and for broadcasts by the Armed Forces Radio Network.

**Fiorello LaGuardia reading the comics (1945)** — One of LaGuardia's most recounted acts as [New York] mayor

was when he read the comics to the children of the city on WNYC radio during the 1945 newspaper delivery strike. He performed animated, dramatic readings, describing the action in the panels, creating different voices and adding excitement with various sound effects. ... Surviving recordings of LaGuardia reading the comics are held in the WNYC Collection of New York's Municipal Archives.

**Harry S. Truman speech at the 1948 Democratic National Convention (July 15, 1948)** — One of Truman's advisors admitted that the president had a "speaking problem" — he relied too heavily on pre-

pared scripts and his delivery was rushed and occasionally unintelligible. In this speech, Truman worked only from a loose script and, as a result, he found his natural voice. In a down-to-earth and direct manner, which included colloquialisms from his home state of Missouri, the feisty president predicted, "Senator Barkley and I will win this election and make the Republicans like it. Don't you forget it." The applause lasted for a full two minutes.

**Ronald Reagan Radio Broadcasts (1976–1979)** — This collection of over 1,000 radio broadcast recordings, the See REGISTRY, page 21 ►

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## PRODUCT EVALUATION

# Yamaha Pocketrak 2G Breaks Size Barrier

*Flash Recorder Offers Big Sound, Long Record Time, USB 2.0 and Rechargeable Battery In 1.7 Ounce Package*

by Frank Beacham

The last couple of years have seen the rapid introduction of many new and improved digital flash recorders.

Part of the trend has been smaller-sized devices. Now, Yamaha has broken the weight and size barrier with a full linear PCM recorder weighing only 1.7 ounces and measuring a half-inch thick.

Yes, folks, full CD-quality 44.1 kHz, 16 bit WAV recording for up to three hours, 10 minutes, in a device the size of a typical voice recorder. The Pocketrak 2G is virtually weightless, easily pocketable and can go anywhere.

This is a \$350 game-changer for radio reporters looking for not only the ultimate in size and portability, but a full-featured, well-built general purpose audio recorder in a black-laquered case measuring 4.5 inches long, 1.4 inches wide and a half inch thick. Best yet, it sounds good — very good.

### Small wonder

Yamaha's engineers did a remarkable job of marrying the right features in a recorder so small.

The Pocketrak 2G features a unique tilt-



up stereo microphone that allows the recorder to rest on a table, yet one can record interviews and other audio without obstructions to the microphone. It also has a built-in, slide-out USB 2.0 connector that enables recordings to be transferred to easily Macintosh and PC computers for editing.

Though this tiny device can record more than nine hours in PCM mode (up to 19 hours for MP3) on a single AAA alkaline, the unit includes a new Sanyo "eneloop" battery that can be recharged via USB up to 1,000 times (90 min. charge time) and does not suffer self-discharge problems prevalent in earlier pocket-sized systems.

Anyone having had to change batteries frequently with previous voice recorders knows this is a major improvement in powering technology.

The Pocketrak 2G features a bright, backlit viewfinder with manual or automatic microphone level control. There's also a built-in speaker, earphone jack and external switchable mic- or line-level input jack. A hard switch on the back of the recorder allows variable playback speed of plus or minus 25 percent.

The recorder features two gigabytes of internal flash memory, plus three MP3 modes (16 to 320 kbps) for extended recording of voice or music. In the lowest quality, mono MP3 mode, the recorder can record 266 hours.

There's also a menu adjustment for setting a "clear voice" function to reduce noise, a three-way microphone sensitivity setting, voice-activated system recording, timer recordings, and when recording CDs, an auto divide function that senses sound divisions and divides tunes into separate files.

### Product Capsule:

#### Yamaha Pocketrak 2G

#### Thumbs Up

- ✓ Smallest full CD-quality audio recorder built; weighs 1.7 oz
- ✓ Excellent audio quality from built-in adjustable mic
- ✓ Built-in USB 2.0 jack, works with any personal computer
- ✓ Solid, easy-to-use software on backlit screen
- ✓ Reasonable \$350 cost

#### Thumbs Down

- ✓ Because it is a music player as well as data storage device, the recorder offers many choices that unnecessarily clutter the interface with features.

PRICE: \$350

CONTACT: [www.yamahasynth.com](http://www.yamahasynth.com)

Index marks can be inserted into recordings. Up to 32 marks can be inserted while either recording or playing back files. This feature helps in locating segments quickly for sound bites from interviews or speeches.

In addition to being used as a portable audio recorder, the Pocketrak 2G can be both a music and data recorder. Music files ripped on a computer in MP3 or WMA format are housed in a music folder and can be played back on the device. There's even DRM 10 support. Data files, which

See YAMAHA, page 21 ►

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# Registry

► Continued from page 19  
majority penned by Ronald Reagan himself, documents the development of his political vision in the years immediately preceding his election to the White House. In the broadcasts Reagan sounded what would become the familiar themes of his presidency: reduction of government spending, tax cuts, supply-side economics and anti-communism. These radio "chats" did not focus on specific policy prescriptions, as much as outlining a conservative governing philosophy, much of which remains with the Republican Party to this day. Also showcased is Reagan's conversational, folksy rhetorical style. ●

**Other entries:**

- "Allons a Lafayette," Joseph Falcon (1928)
- "Casta Diva," from Bellini's "Norma"; Rosa Ponselle, accompanied by the Metropolitan Opera Orchestra and Chorus, conducted by Giulio Setti. (Dec. 31, 1928 and Jan. 30, 1929)
- "If I Could Hear My Mother Pray Again," Thomas A. Dorsey (1934)
- "Sweet Lorraine," Art Tatum (Feb. 22, 1940)
- "Call it Stormy Monday but Tuesday is Just As Bad," T-Bone Walker (1947)
- "The Jazz Scene," various artists (1949)
- "It Wasn't God Who Made Honky Tonk Angels," Kitty Wells (May 30, 1952)
- "My Fair Lady," original cast recording (1956)
- Navajo Shootingway Ceremony Field Recordings, recorded by David McAllester (1957-1958)
- "Freight Train," and Other North Carolina Folk Songs and Tunes," Elizabeth Cotten (1959)
- Marine Band Concert Album to Help Benefit the National Cultural Center (1963)
- "Oh, Pretty Woman," Roy Orbison (1964)
- "Tracks of My Tears," Smokey Robinson and the Miracles (1965)
- "You'll Sing a Song and I'll Sing a Song," Ella Jenkins (1966)
- "Music from the Morning of the World," various artists; recorded by David Lewiston (1966)
- "For the Roses," Joni Mitchell (1972)
- "Headhunters," Herbie Hancock (1973)
- "The Sounds of Earth," disc prepared for the Voyager spacecraft (1977)
- "Thriller," Michael Jackson (1982)

# Yamaha

► Continued from page 19  
also can be moved via USB, are stored in a data-only folder. Another folder houses MP3 files ripped from a CD player.  
Certain folders can be password-protected for security. As a mass storage class device, the built-in USB connector is simply plugged into any computer. It then shows up on the desktop as a storage device. Files can be dragged and dropped onto or from the icon.

**Production**

Included with the Pocketrak 2G is a licensed copy of Steinberg's Cubase AI4 for both Macintosh and Windows. This is comprehensive music production software offering up to 48 simultaneous audio tracks and 64 MIDI tracks, plus a variety of VST plug-in software synths and effects, as well as full VSTi compatibility.  
The "AI" in Cubase AI4 stands for Advanced Integration, and this new software delivers sophisticated functions and a high level of hardware/software integration.

This includes SoundFrame, an integrated feature built into Cubase AI4 that manages sounds, samples, presets and loops in one centralized database. There also are extensive editing capabilities.

The inclusion of the Cubase software indicates that perhaps the intended market for this recorder is musicians and composers. However, it's hard to ignore the device's potential for radio news and interviews. This is the smallest CD-quality audio recorder ever made and I suspect a wide range of users will be attracted to its capabilities.

There are certainly flash memory audio recorders with more features including digital I/O, such as Sony's excellent PCM-D50. However, nothing on the market can compete with the Yamaha's diminutive size. For portability, the Yamaha is the slam-dunk winner.

When we tested the tiny recorder we found the audio quality superb and the build-quality excellent. The little built-in stereo mic sounded fine, with precise bass and presence. The user interface was first-rate, making ease of operation very good. If I have a criticism, it's that the recorder has too many features, trying to be something for everyone.

For a highly-portable audio recorder that can be carried virtually invisibly anywhere and everywhere, the Yamaha Pocketrak 2G is the new standard. Radio reporters should take note of this one.

Frank Beacham is a New York-based writer and producer. ●

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## Researchers Explore Digital Coverage

*NPR Labs Seeks Answers About the Difference In Coverage Between FM IBOC and Analog*

by Leslie Stimson

Public radio wants to know how far its digital signals are going, and how susceptible to interference neighboring analog stations are.

So the Corporation for Public Broadcasting commissioned NPR Labs to conduct a series of tests to find out.

The lab developed a computer-generated coverage prediction model for HD Radio.

The engineers developed the model from IBOC receiver tests conducted in its lab and validated it with thousands of miles of driving tests, to study the short-fall in IBOC coverage vs. FM analog coverage. It also used the model to predict interference from stations transmitting IBOC signals to adjacent analog neighbors.

John Kean, NPR Labs senior technologist, made the first public comments on the findings at the Public Radio Engineering Conference in April. The gist of the findings also was summarized in his NAB2008 Broadcast Engineering Conference paper on the topic.

CPB was reviewing the full 260+-page report in June.

The findings are seminal as the industry debates the value of, and how best to push for, FCC approval of elevated FM IBOC power.

Overall, the results show the best FM IBOC coverage in cars, and a dramatic drop-off in digital coverage for home receivers.

While an IBOC power increase would most benefit home listening, the resulting increased interference would likely hurt analog mobile coverage, Kean told Radio World.

Any power increase would need to be

approved with care, he said, noting that NPR itself hasn't taken a position on the elevated power issue.

### Predicted coverage

In general, based on terrain-sensitive, computer model-predicted coverage comparing listeners with a protected signal to station IBOC coverage, the lab found mobile reception for FM IBOC was 70 to 90 percent of analog, on a population basis, using data from the 2000 U.S. Census. Indoor and portable reception were both 50 to 60 percent of the analog.

The computer model includes the total number of people predicted to be served assuming all stations in a market are transmitting both analog and digital signal.

"Service" for digital is straightforward; signal is either there or it's not. For analog, the lab used the criterion of stereo weighted quasi-peak audio signal-to-noise ratio of 40 dB. If the audio dropped below 40 dB due to noise or interference, that didn't count as population getting audio service, Kean said.

Coverage predictions were validated by drive tests at 10 public stations and one commercial station, CBS-owned WJFK(FM), Washington, chosen because it is local to NPR Labs and has known interference from two adjacent-channel stations to its north, WWMX(FM) in Baltimore and WWEG(FM) in Hagerstown, Md.

Kean used WJFK to verify whether his model could predict interference reliably.

The lab created a portable measurement system and conducted field strength measurements in indoor settings in the Washington area such as shopping malls, homes and offices.

Kean said Senior Engineer Jan Andrews gathered HD-R signal data while carrying a normal mode helix antenna that Kean designed. The antenna delivered gain like that expected from a three-foot-tall model, though Kean's was shorter.

It was preferable to most portable antennas, and the lab staff didn't want to carry a whip antenna through buildings

**Overall, the results show the best FM IBOC coverage in cars, and a dramatic drop-off in digital coverage for home receivers.**

such as a mall, Kean said.

NPR Labs performed driving tests on WAMU and WJFK, while Cavell, Mertz & Associates conducted drive testing for 10 FM public stations: WBEZ, Chicago; WHRV, Norfolk, Va.; WFYI, Indianapolis; KXPR, Sacramento; WNCU, Durham, N.C.; KVPR, Fresno, Calif.; KQEI, North Highlands, Calif.; WMUB, Oxford, Ohio; KMPO, Modesto, Calif.; and WWFM, Trenton, N.J.

The stations singled out for drive tests are of differing class sizes and amounts of known interference.

Interference on IBOC reception behaves differently than on analog, said Kean. Listeners have told station engineers that if they drive from a station in one direction, the IBOC reception is good, but if they drive in another direction, it drops out.

### Main Findings So Far:

- Mobile reception for FM IBOC was 70-90% of analog;
- Indoor and portable reception were 50-60% of the analog;
- Improved receiver & antenna performance may make up part of the coverage gap;
- Use of single-frequency networks also may help.

As far as he knows, Kean said, no other IBOC coverage maps in use today consider predicted interference.

### Impact

He computed the impact of interference on both analog and IBOC coverage.

As for the interference impact of IBOC DAB to analog, the lab found "little or none" for most stations tested but "moderate to severe" interference for a minority of stations.

Kean didn't assign hard numbers in his presentations, but in an interview he estimated, that, as an example, "moderate" might be a loss of around 25 percent of population served.

Increasing the IBOC power level from the current -20 dB to -10 dB causes a substantially larger amount of interference, including a larger number of stations that may lose 50 percent of their analog service population on a noise-limited service basis, according to Kean's findings.

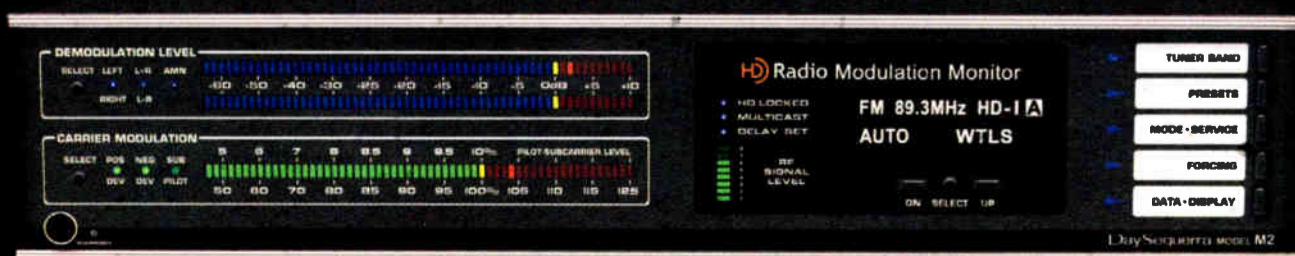
He considers his approach different from how HD Digital Radio Alliance stations tested elevated power levels, on which we've reported.

The commercial stations made audio recordings at elevated power levels, listened to them, and stated whether or not they heard interference.

NPR Labs tested consumer receivers and applied those ratios to coverage prediction models taking into account terrain

See KEAN, page 26 ►

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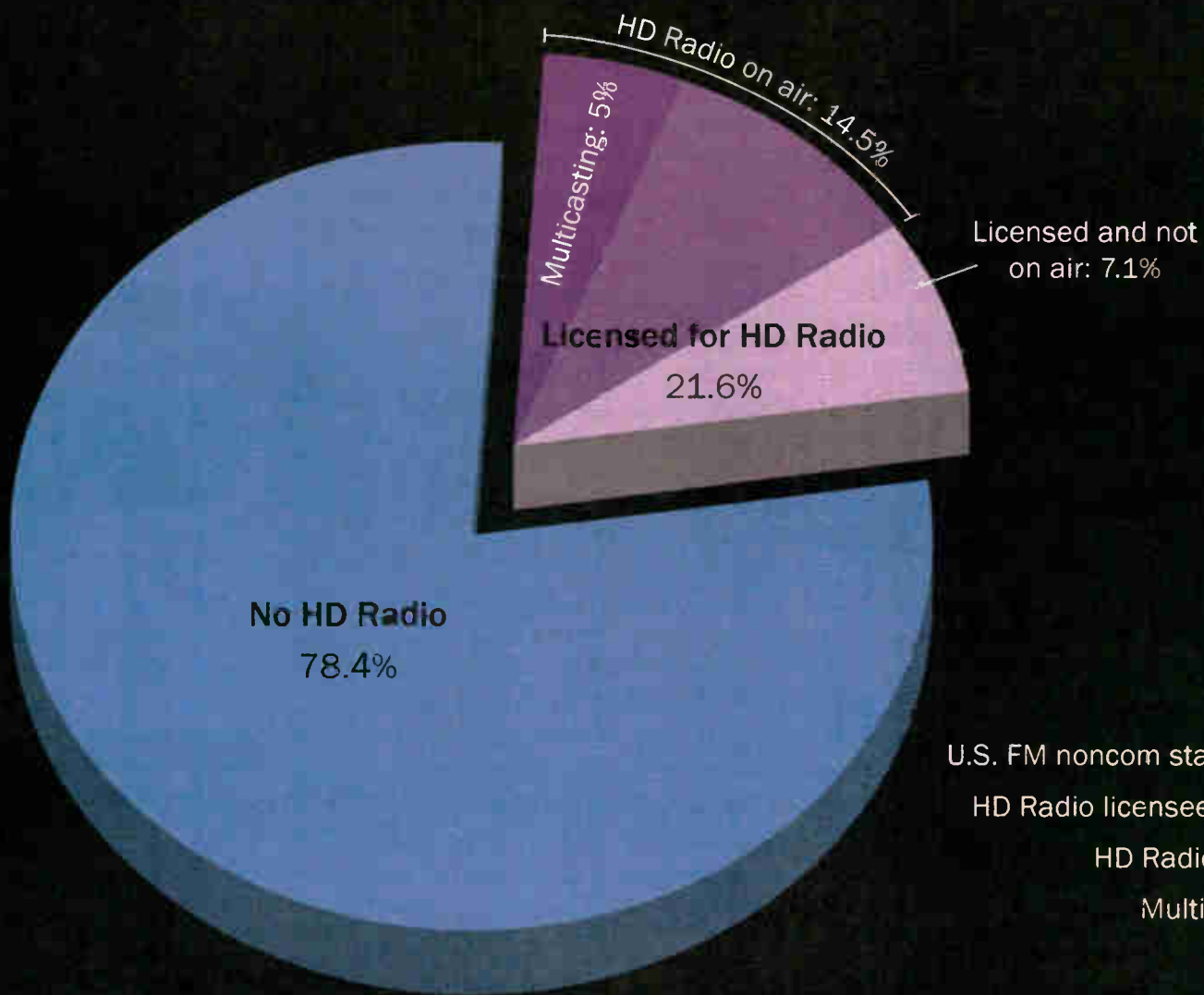
BE	1	1	1	1	1	1	1	1	1	1	Total	9
Visitors	1	0	1	0	0	0	0	0	0	0		2

Sponsored by Broadcast Electronics

# Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp., the HD Digital Radio Alliance, BIA Financial Network and other sources. Data reflect best information as of early June. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

## HD RADIO AT FM NONCOMMERCIAL STATIONS

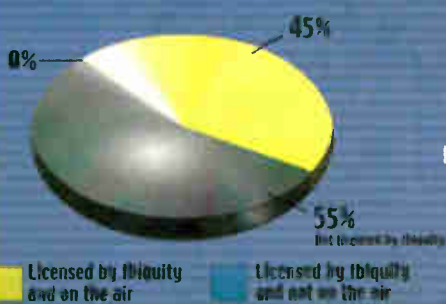


U.S. FM noncom stations: 2,722  
 HD Radio licensees, total: 588  
 HD Radio on air: 395  
 Multicasting: 135

Source: Data is from BIA Financial Network's data service MEDIA Access Pro™ and also includes iBiquity information. Visit [www.bia.com](http://www.bia.com)

### HD Radio at Peak Broadcasting

Total stations: 11



### The HD Radio Bottom Line

	Total Licensed	On the Air	FMs Multicasting
<b>Current</b>	2,170	1,713	885
Last Month:	2,125	1,675	878
Last Year:	1,851	1,325	660

World Radio History

# Can a radio console be over-engineered?

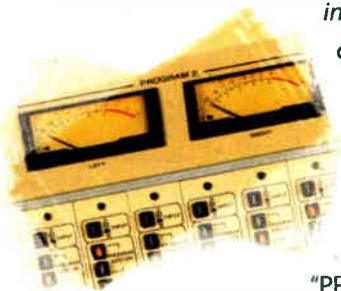
(Only if you think "good enough" really is good enough.)

## "OCD" redefined

Building great consoles is more than punching holes in sheet metal and stuffing a few switches in them. Building a great console takes time, brain-power and determination. That's why we've hired brilliant engineers who are certified "OCD": **Obsessive Console Designers**, driven to create the most useful, powerful, hardest-working consoles in the world.

## How It began

"20-odd years ago," says Axia President Michael "Catfish" Dosch, "I was designing custom consoles for recording studios. Somebody at **PR&E** – it was still called **Pacific Recorders** then – liked what I was doing and invited me to move there. Work with Jack Williams, the guy who practically *invented* the modern radio console? I jumped at the chance; BMX consoles were ultra-reliable, sounded great, and nearly indestructible!



"PR&E was a dream job. Jack taught me how to design consoles without compromise — how to **over-engineer** them. It's great to see, 15 or 20 years later, that many of the boards I designed are still on the air.

"By the late 1990s, computers and routing switchers were becoming an essential part of the broadcast studio, and I'd been thinking about how useful it would be to combine console, router, and computer network. I shared some of my ideas with Steve Church, who'd introduced digital phone hybrids and ISDN codecs to radio. He thought the same way I did about computers in radio studios, and we decided to work together."

## A new kind of console

In 2003, Axia was launched to make digital consoles, but with a twist: Axia consoles would be integrated with the routing switcher, and **networked** to share resources and capabilities throughout the studio complex. This intelligent network of studio devices lets Axia build consoles that are **more powerful** and easier to use than ever.

Our team of engineers blended the best ideas from



First Axia console prototype. Nice test stand. Catfish.

old-school analog consoles with innovative new technology to produce **bullet-proof boards** that can actually make shows run smoother and sound better.

And we invented a way to network studios, consoles and audio equipment using Ethernet. It's called **Livewire™**, and it's now an industry standard.

Livewire carries hundreds of channels of real-time, uncompressed audio plus synchronized control logic and program-associated data on just one skinny CAT-6 cable.

Lots of well-known broadcast software and hardware companies (over two dozen already) now make products that work directly with Livewire. Thanks to this scalable network technology, **integrated router control** is a standard feature of every Element. Any source in any studio can be loaded on any fader with no need for add-on panels.

And Livewire lets you bring computer audio into the air chain without going through multiple A/D/A conversions. Our **IP-Audio Driver** lets you connect computers directly to the network without any intermediate I/O — all that's needed is a CAT-5 cable and your computer's Ethernet port.



## Feature packed

Board-ops told us they wanted a console that's **powerful, yet easy to use**. So we designed Element to be user-friendly, yet still have all the power of a full-on production board.

For example, Element Show Profiles can **recall each operator's favorite settings** with the push of a button — audio sources, fader assignments, monitor settings and more. And each jock's Show Profile contains personalized **Mic Processing** and **Voice EQ** settings that load every time they're on the air (so the midday guy will stop badgering you for "just a little more low end"). There's even a "panic button": one key-press returns a Show Profile to its default state instantly. (No more 3 A.M. "Help!" calls.)

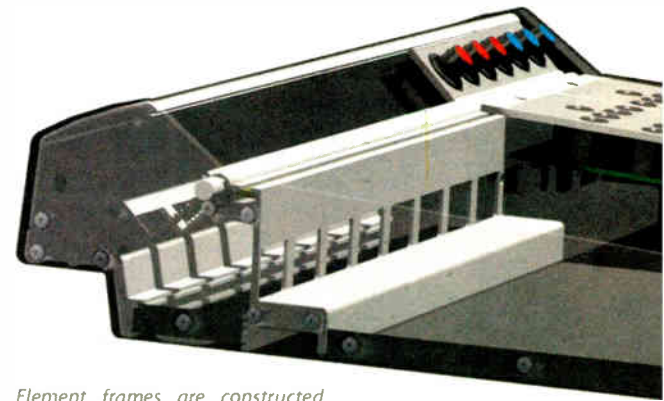


There's a reason these board-ops are smiling. Axia consoles are in more than 1000 studios worldwide.

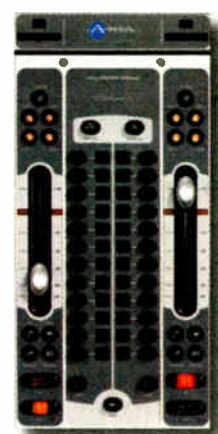
Did we say "mic processing"? You bet. Every voice channel gets **studio-grade compression, de-essing and expansion** from the processing experts at Omnia, plus three-band parametric EQ to sweeten the deal. There's even **built-in headphone processing** so you don't

have to waste money building a separate side-chain just for the studio cans.

Jocks have complained for years that making a mix-minus is too hard — so Element **constructs mix-minuses automatically**. Plus, mix-minus settings are saved for each audio source, so that sources, backfeed and machine logic all load at once. And every fader has a "Talkback" key to **communicate with phone callers**, remote talent or other studios using the console mic.



Element frames are constructed from custom aluminum extrusions for maximum rigidity. Module face plates and console side panels are machined from thick plate aluminum. Even the hand rest is a beefy extrusion. With all this heavy metal, even that ham-handed overnight jock won't be able to dent it.



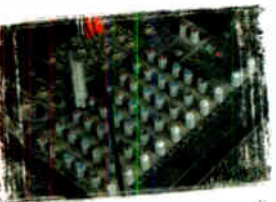
Speaking of phones, board-ops have enough distractions without having to reach for an outboard phone control panel. Element has **hybrid controls with dedicated faders** for Telos talkshow systems; there's even a **dial pad** so jocks can dial, pick up, screen and drop calls without ever diverting their attention from the console.

Nearly every air talent has accidentally changed a fader's audio source while it was on-the-air. To prevent that error, **Element "queues" source changes**: the operator must turn the fader off before the next assigned source "takes".



## The radio console, redefined.

Element was designed to fulfill either a **production or on-air** role, with amazingly powerful features waiting just beneath the intuitive surface. For instance, Element can mix in 5.1 Surround as well as stereo. That's standard; **nothing extra to buy** (except more speakers). There are four stereo Aux Sends and two Aux Returns, so production guys can use their favorite outboard FX boxes. Great for **custom IFB feeds**, too.



Clear the junk out of your studio. Element has 8 submixers built in.

Got a PA mixer tucked away in a studio corner to mix mics for live performers, talk shows and such? Element has **8 Virtual Mixers** — no outboard gear needed. And the Virtual Mixers emulate ACU-1s, allowing tight integration with automation and satellite systems.

You can **administer Element remotely**, from home, the airport — wherever there's network access. A password-protected web server lets you examine the state of the console, see what's on the air and even fix operator mistakes, without ever leaving the comfort of that new Aeron™ desk chair you (ahem) "requisitioned" from the Sales department.



Small VU meters mounted at desk level are hard to read, so we re-invented the traditional meter bridge. Element's **big meters** are presented on an easy-to-read computer monitor along with large analog and digital clocks, event and countdown timers, and tallies that light when mics are open, delay is active, or during phone calls. You can even customize the display by adding your station's logo.



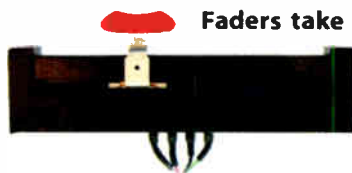
## Beneath the surface

There's more to building a great board than just features. **Consoles have to be rugged**, to perform flawlessly 24/7, 365 days-a-year, for years at a time. So when it came time to choose the components that would go into Element, we literally scoured the globe for the absolute best parts — parts that would take the torture that jocks dish out on a daily basis.

First, Element is fabricated from thick, **machined aluminum extrusions** for rigidity and RF immunity. The result: a board that will stand up to nearly anything.

With so many devices in the studio these days, the last thing anyone needs is gear with a noisy cooling fan. That's why Element's **power-supply is fanless**, for perfectly silent in-studio operation.

Element modules are **hot-swappable**, of course, and quickly removable. They connect to the frame via CAT-5, so pulling one is as simple as removing two screws and unplugging an RJ — no motherboard or edge connectors here.



**Faders take massive abuse.** The ones used in other consoles have a big slot on top that sucks in dirt, crumbs and liquid like the government sucks in taxes. By contrast, our silky-smooth conductive-plastic faders actuate from the side, so **grunge can't get in**. And our rotary controls are high-end optical encoders, rated for more than **five million rotations**. No wipers to clean or wear out — they'll last so long, they'll outlive your mother-in-law (and that's saying something).

Element's **avionics-grade switches** are cut from the same cloth. Our design team was so obsessed with finding the perfect long-life components that they actually built a mechanical "finger" to test switches! Some supposedly "long life" switches failed after just 100,000 activations; when they found the switches used in Element, they shut off the machine after **2 million operations** and declared a winner. (The losers got all-expense-paid vacations to the landfill.)



Individual components are **easy to service**, too. Faders come out after removing just two screws. Switches and rotary volume controls are likewise easy to access. And all lamps are LEDs, so you'll likely never need to replace them.

Engineers have said for years that console finishes don't stand up to day-to-day use. Silk-screened graphics wear off; plastic overlays last longer, but they crack and chip — especially around switches and fader slots, where fingers can easily get cut on the sharp, splintered edges. We decided that we could do better.



Element uses high-impact Lexan overlays with color and printing on the back, where it **can't rub off**. And instead of just sticking the Lexan to the top of the module like some folks do, our overlays are **inlaid on the milled aluminum module faces** to keep the edges from cracking and peeling — expensive to make, but worth it. For extra protection, there are **custom bezels** around faders, switches and buttons to guard those edges, too. Element modules will **look great for years**.



By the way, those on/off keys, fader knobs and bezels are our own design, custom-molded to give **positive tactile feedback**. The switch is flush with the bezel, so it's easy to find by touch. But if something gets dropped on it, the bezel keeps the switch from being accidentally activated.

## More than just products

Catfish learned something else important from his time at PR&E: "Even the best products are nothing without **great support**." So Axia employs an amazing network of people to provide the best support possible: Application Engineers with years of experience mapping out radio studios... the most **knowledgeable, friendly** sales people in the biz... Support Engineers who were formerly broadcast engineers. Plus a genius design team, software authors who dream code... one of the **largest R&D teams** in broadcast.

And now Axia has become radio's **first console company to offer 24/7 support**, 365 days a year. Chances are you'll never need that assistance, but if you do, we'll be ready for you. Our 'round-the-clock help line is +1-216-622-0247.



## Proudly Over-Engineered

Are Axia consoles over-engineered? **You bet.** If you're looking for a cheap, disposable console, there are plenty out there — but this ain't it. Not everyone appreciates this kind of attention to detail, but if you're one who seeks out and appreciates excellence wherever you may find it... Axia consoles are built **just for you**.



[www.AxiaAudio.com](http://www.AxiaAudio.com)

NEWS WATCH

**DTV CAMPAIGN:** The FCC launched its DTV education campaign in Wilmington, N.C. in June to prepare consumers about that market's special early September transition. The "First in Flight, First in Digital" campaign includes billboard messages, and radio and TV PSAs.

**IBOC STANDARD REVISED:** The National Radio Systems Committee published its updated IBOC technical standard. As we've reported, NRSC-5-B specifies the requirements for broadcasting digital audio and ancillary data signals in the AM and FM radio bands. NRSC members described the most recent changes as minor when they voted on them at NAB2008. The updated version makes clear that the system supports three distinct data services, and discusses spectral emission limits for both AM and FM IBOC. Download the standard at [www.nrscstandards.org/SG/NRSC-5-B.asp](http://www.nrscstandards.org/SG/NRSC-5-B.asp).

**SAT SUIT:** U.S. Electronics filed a Freedom of Information Act Suit seeking documents relating to Sirius and XM's compliance with FCC regulations. The electronics manufacturer says the documents shed light on the companies' failure to bring an interoperable radio to market, instances of exceeding emission standards and improper tower siting. According to the suit, the information sought is "directly relevant to the FCC's determination whether the public interest will be served or harmed" by a merger of Sirius and XM.

**'PUBLIC' REVISED:** The FCC has revised "The Public and Broadcasting." The document is designed to educate the public about the commission. The agency reminds stations they must keep a printed copy in their public files. Find it at [www.fcc.gov/mb/audio/decdoc/public\\_and\\_broadcasting.html](http://www.fcc.gov/mb/audio/decdoc/public_and_broadcasting.html). The commission has added contact info for "Broadcast Information Specialists" who can answer questions from the public about how to become involved in the commission's processes. Inquiries about complaint or petitioning procedures or the status of a license renewal, modification or assignment or transfer application for a particular station can be answered at [radioinfo@fcc.gov](mailto:radioinfo@fcc.gov).

# Kean

► Continued from page 22 characteristics and the population to determine the number of listeners whose reception would be impaired by interference.

The lab used its HD-R coverage model coupled with Terrain Integrated Rough Earth Model point-to-point software to produce field strength predictions.

In his report to CPB, which funded the studies for an undisclosed amount, Kean predicts little near-term improvement in HD-R receiver performance and said receiver performance actually may decrease given engineering pressures from price competition.

Ways to boost IBOC service include improving receiver performance as well

**Kean predicts little near-term improvement in HD-R receiver performance and said receiver performance actually may decrease.**

as that of indoor and portable antennas, he said. Single-frequency networks also might be used to make up part of the coverage shortfall.

Though NPR Labs is using its model to test FM stations, it can be applied to AM with adjustment for interference ratios pertinent to IBOC in this band. Daytime and nighttime coverage could be predicted using groundwave and skywave field strength values, much as analog AM is predicted today.

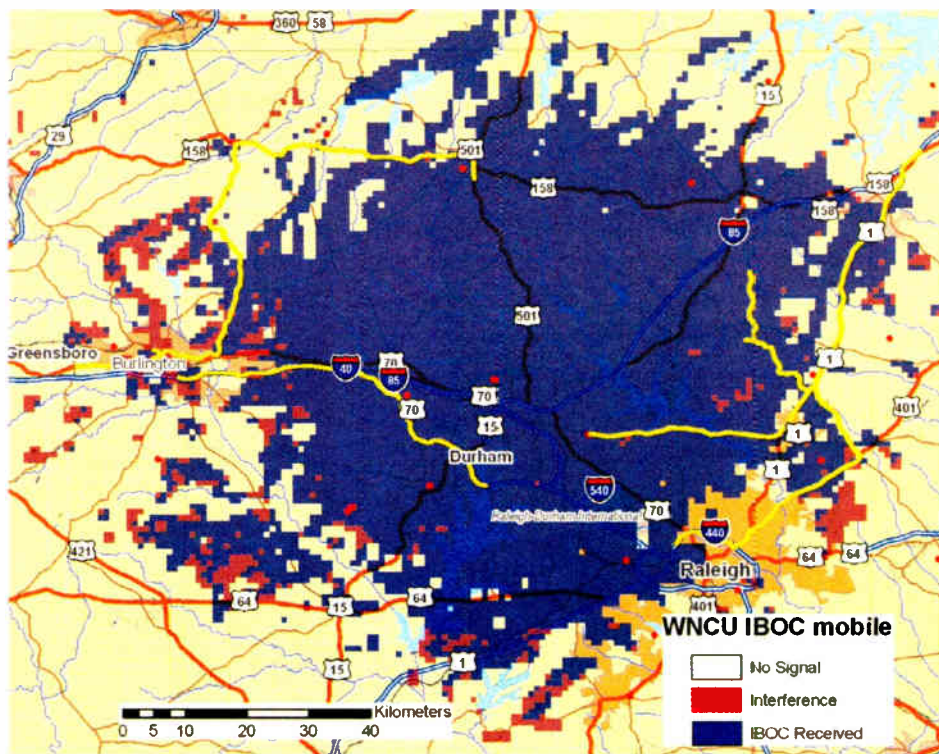
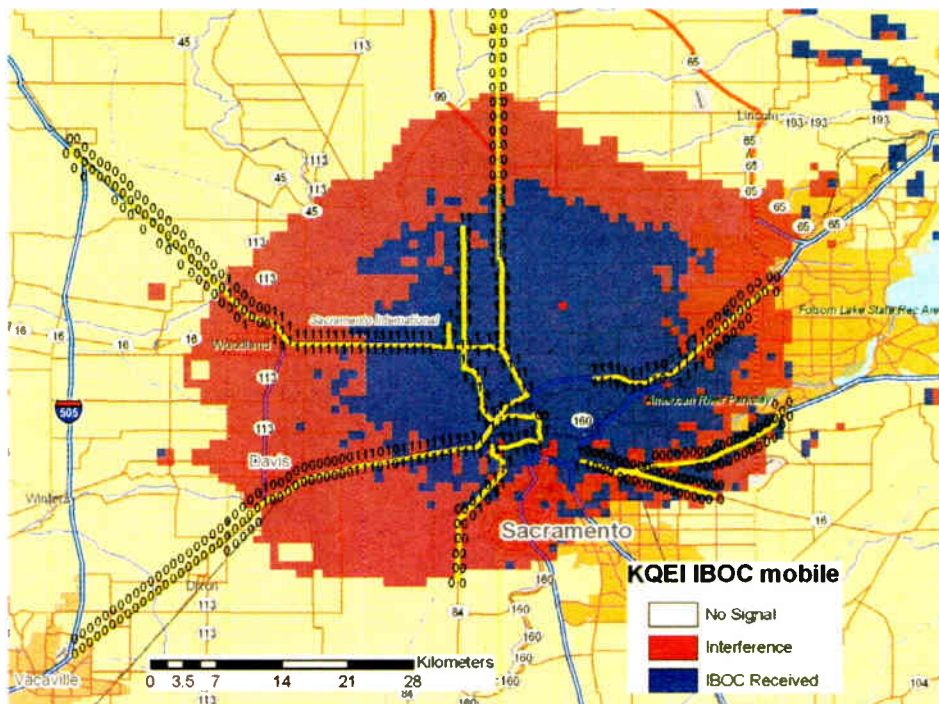
**Model a 'big task'**

The back story of how NPR's IBOC coverage prediction model came to be is interesting.

While the National Radio Systems Committee tested transmission characteristics and compatibility of HD Radio before recommending FCC adoption, Kean said the NRSC paid less attention to actual FM IBOC coverage, especially in the presence of signal interference from neighboring stations that occupy first- or second-adjacent channels.

NPR wanted to determine the IBOC coverage relative to analog FM, as well as potential interference impact on analog stations. No HD-R coverage prediction model existed, he said; developing one was "a big task."

Kean said NPR Labs' prediction mod-



These maps show predicted IBOC coverage for WNCU and KQEI, two stations in the NPR Labs' drive-test. The presence of actual digital reception is indicated by '1' along the routes; '0' indicates no reception. Red-shaded areas show where the coverage model predicted interference to HD Radio service, that is, where reception would be possible in the absence of interference. Blue-shaded areas show interference-free HD-R reception.

el now is providing remarkably accurate predictions of IBOC digital radio coverage. "For every measurement second, it correctly predicted whether radio could receive IBOC 90 percent of the time."

He can also now predict when there will be no IBOC reception.

The model is based on thousands of miles of drive-test data as well as indoor testing. In the first round of receiver tests, the lab reviewed 35 analog and 15 IBOC radios. In the second round, it tested 40 radios, a mixture of analog and HD-R receivers.

Each radio required up to six hours of testing, including 118 tests and up to 4,200 measurements per radio.

The lab has made IBOC coverage prediction maps, delivered to CPB, for some

850 CPB-qualified public radio stations.

NPR Labs also conducted interference susceptibility tests on IBOC receivers in a controlled setting.

In general, at 30 dB listeners rated the audio as poor. At 25 dB a majority claimed they would turn the radio off the interference was so bad, according to Kean.

NPR Labs is testing consumer radios and conducting field measurements of mobile and indoor reception, and Kean said it will continue to do so.

The more measurements the industry collects, the more it will know about how the next generation of HD-R receivers will behave, he told RW.

The lab also studied the impact of IBOC on FM translators, using prediction models of field strength from first-, second- and third-adjacent channels. This material was included in its report to CPB but not publicly presented in detail.

NPR Labs is conducting the tests with grant funding from CPB, which is concerned about potential disenfranchisement of listeners due to the loss of services during and after the conversion of public stations to digital. NPR has filed a provisional patent application for the model.

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RoHS

Radio World's HD Radio Scoreboard is published in alternating issues. Selected data is from BIA's MEDIA Access Pro™, the scoreboard also uses information supplied by sources including

**BIA Financial** network

iBiquity Digital Corp., the HD Digital Radio Alliance and RW's own research.

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expert-led sessions addressing the hottest industry topics, such as: thriving in a multi-platform world; using new technologies to generate new revenue streams; managing in a challenging environment; developing talent; and cultivating the next generation of listeners.

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## USER REPORT

# CBS Radio Covers Atlanta With BE FMi 703

by Robert La Fore  
Market Chief Engineer  
CBS Radio/Atlanta

This user report was prepared for the May 7 Buyer's Guide for Transmitters but did not appear in that issue.

**ATLANTA** Here in Atlanta, we start thinking of transmitter contingency plans around the beginning of June and we don't stop until the end of May. Atlanta is in prime hurricane country, so we don't dare take anything for granted if we want to keep our stations, WZGC(FM), WAOK(AM) and WVEE(FM) on the air.

CBS' WVEE is one of the more popular urban formatted stations in the country, and the highest-rated station in Atlanta; and WZGC is a popular station in its own right, as is WAOK 1380. Having the stations suddenly trail off the dial, even during a hurricane, wouldn't do.

Therefore, we're constantly taking inventory of transmitters and towers, and we're always playing "what-if" scenarios and bettering sites and equipment as a result. That is in fact what we were doing when the storm hit.

## Out with the old

The old WZGC main tower site located on Peachtree Plaza was an older site and we were in the process of leaving for a new site at Richland Tower. At Richland, we had just received a new Broadcast Electronics 35T single-tube transmitter, part of a grand capital acquisition plan that would eventually include a new BE FMi 703 transmitter for broadcasting HD Radio. But, as they say, even the best-laid plans ...

Those plans went out the window when a hurricane/tropical storm hit and burned up the antenna at the Peachtree tower site, the only functioning site where WZGC was broadcasting from



Several BE transmitters during the installation phase at WZGC.

until the new site could be completed. We were at our most vulnerable, and so we did what we normally do: we took inventory of transmitters and towers.

It just so happened we had received a new BE FMi 703 solid-state transmitter for converting WVEE to digital. Although the transmitter was intended for HD Radio broadcast, we unboxed it and looked it over. I quickly placed a call to BE customer service to get instructions for changing the operating frequency from WVEE's 103.3 to WZGC's 92.9 MHz, and then ran down to the nearest Home Depot to get some wire for the electrical to do the breaker panel plus the spare six-bay. This backup antenna was new, and was to serve as a backup antenna for either WZGC or WVEE at the WVEE site. The antenna had been up for about two weeks, and had never been tested with high power.

Within two hours, the transmitter was up and running, covering the better part of Atlanta at reduced signal through the

new antenna. That little transmitter saved the day. Even though the FMi 703 is intended for HD Radio broadcast, it's adaptable to broadcast in analog. We managed to stay on the air without missing a beat, which made our accountants very happy. The station ran that way for almost a month, until we could finish the new tower.

To complete the new Richland site, I unboxed the BE transmitter, the BE 35T single-tube, and juiced it up to 33 kW analog output with no problems. We elected to place the new 35T in a TV suite at Richland until our transmitter suite was completed. As before, BE documentation was top notch, and customer service was excellent. I've had to contact BE tech support only once, and that was just to make sure I was tapping the plate transformer correctly for the increased TPO when we went to combined HD Radio operation.

That 35T would see yet another move, as we finally were able to move it into

our newly completed transmitter suite, and marry it to another FMi703. We again relied on the trusty FMi703 back at the WVEE site to maintain WZGC on air while we moved the 35T again. On a Friday night we moved the 35T into the new suite, and returned to full power in just a few hours.

Soon after we installed the BE 35T at WZGC, we turned on another BE 35T transmitter in aux service for WVEE, and again, the installation was easy and painless. We consider ourselves to be lucky to be able to operate the station at 100 ERP from mid-town Atlanta, when our competitors have rimshot coverage of Atlanta from towers several miles away.

We continue to use the same BE transmitters for analog and HD service. Each of the four transmitters has been extremely reliable. One of the features I like is the BE RTDS software, which gives a display of important transmitter parameters. The RTDS software also keeps an event log during an overload situation. The event log is extremely useful for troubleshooting.

We are running the Broadcast Electronics IDI-20 importers for multicasting of our HD2 and HD3 channels. Recent software upgrades to the IDI-20 have resulted in very stable multicasting signals with hardly any few glitches or dropouts.

I am always comforted to know that I have the FMi-703 transmitters at both of my FM sites, so if I need to be "creative" in keeping a station on air, the FMi703 is there and ready.

For more information, including pricing, contact Broadcast Electronics at (217) 224-9600 or visit [www.bdcast.com](http://www.bdcast.com).

## PEOPLE NEWS

Clear Channel Radio named its Engineers of the Year: **Josh Hadden**, director of engineering and IT, Clear Channel New York; **Jeff Bennett**, director of engineering,



Jeff Bennett



Josh Hadden

Clear Channel Dayton; and **John Paoli**, AM chief engineer, Clear Channel Los Angeles.

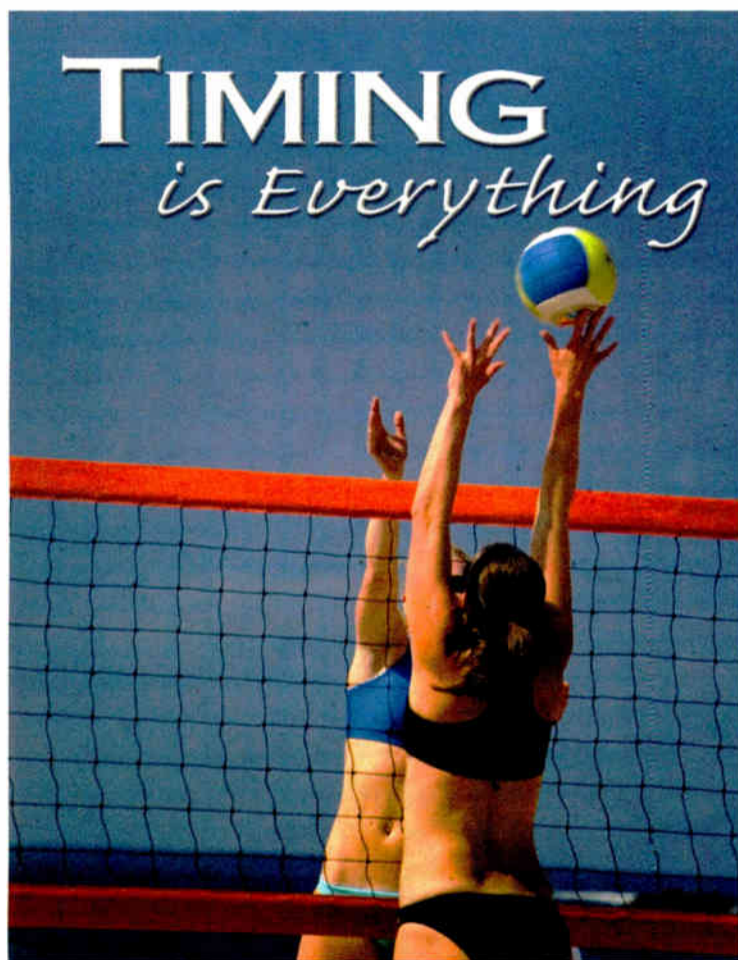


John Paoli

Hadden was honored for his work in constructing a new office and studio complex that consolidated operations of the company's New York radio stations.

Bennett was noted leadership and technical direction at the Dayton cluster, including testing and refining monitoring and control software to be deployed throughout the radio group.

Paoli rebuilt the KFI tower that was destroyed by an airplane in 2004. He managed reconstruction logistics, including legal and regulatory requirements.



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# Buyer's Guide

Radio World

Consoles, Mixers &amp; Routers

July 2, 2008

## USER REPORT

## Livewire: Cost-Effective Routing Control

*Axia Nodes Enable Routing Flexibility, Ethernet Switching, Console Configuration for KWMU*

by **Terrence Dupuis**  
Chief Engineer  
KWMU(FM)

those we replaced — you only have as much signal routing capability as you've built into your patching system.

Configuring the system is intuitive and is accomplished in a short period of time. Getting a grasp on the system's programming took a little getting used to, partly because each component in the system has its own IP address; but in the long

practice, you get the hang of it pretty quickly. (During the time we were ramping up, Axia's support team was there, clarifying issues for us and providing guidance.)

In terms of cabling and programming, our system was functional after three days. We chose to interconnect our audio devices via Radio Systems StudioHub+ Cabling. This arrangement worked well for us, as Axia nodes are pin-compatible with StudioHub+ components. This makes for a clean and fast installation, without the expense typically incurred in more conventional wiring systems.

Overall, we spent just over a month putting everything together, but the bulk of this time was spent on cosmetic issues such as fitting the Element consoles into our studio furniture. After all, this is a studio, and it's got to look cool. And it does look cool.

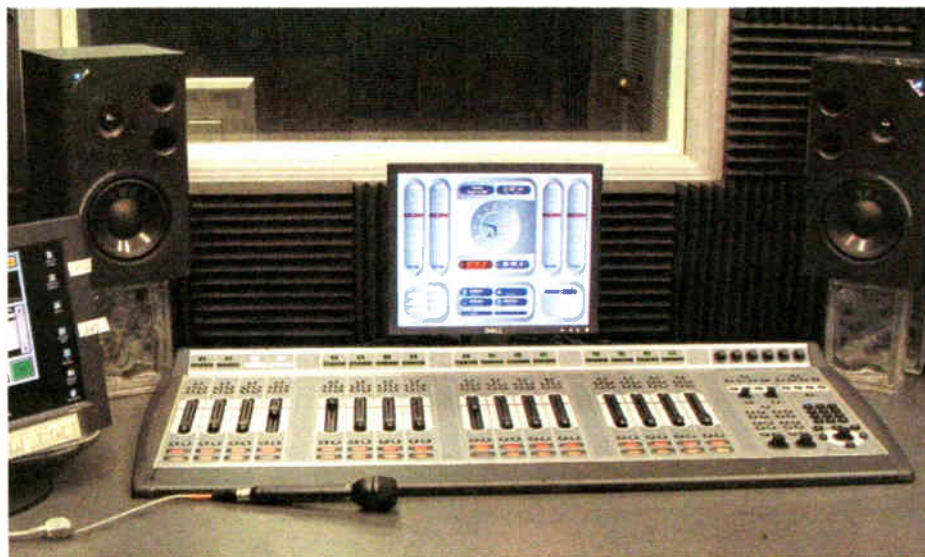
**ST. LOUIS** Founded in 1972, KWMU (FM) is an NPR affiliate located on the campus at the University of Missouri St. Louis.

Our format is news/talk radio, and in addition to broadcasting a 100,000 watt signal reaching 2.4 million people in the bi-state area, we also have a streaming presence on the Internet at [www.kwmu.org](http://www.kwmu.org). We are a professionally staffed operation with 30 full-time and 12 part-time members on our team.

In 2005, we installed an Axia Livewire Audio Network, the result of an exhaustive search that examined a variety of competing systems.

Our broadcast facility consists of four studios: Air Control (the primary source of our on-air activities), Production A, Production B and Production NB (our news booth).

In Air Control, we have a 20-position



'Previously, we had three separate console systems,' said Dupuis. 'With our Axia network, we're set up in such a way that we essentially have a single console system, distributed among our four studios.'

**Previously, we had three console systems; now we essentially have a single console system, physically distributed among four studios.**

Element console. Production A contains our largest Element, with 16 faders in a 24-position frame, and both Production B and Production NB utilize 12-position Elements. Along with the consoles, there are a variety of Axia Audio nodes which make up the Livewire network and routing system.

### Transferable skills

There were several factors that led to our choice of Axia for our studio rebuild.

First, as a non-profit organization, price is always important; the fact of the matter is we're simply not "rolling in the dough."

The Axia system represents value. The ability to run the entire system over standard Cat-6 Ethernet cable represents a huge savings over the cost of conventional wiring.

Ethernet already is the most common method for transferring digital audio in a broadcast environment, so it makes perfect sense to run the entire system this way. Ethernet switches are an extremely cost-effective way of routing signals.

Another consideration for us was signal routing flexibility. With most consoles — certainly analog models like

By contrast, Axia's PathfinderPC routing control software offers greater flexibility with less hassle. If the target device is on the network, you can access it — without having to run any additional lines.

Previously, we had three separate console systems; with our Axia network, we're now set up in such a way that we essentially have a single console system, physically distributed among our four studios. Routing for Production A, Production B and News can go through the Element controller in Air Control to get on air or be individually assigned, as needed, to be the main air studio.

In changing over to our new system, we had concerns about the ability of both our engineering staff and the on-air talent to adapt. Much to our surprise, this turned out to be a non-issue.

The on-air talent genuinely has been excited about working behind the new Elements. With its ability to be programmed for each user or show and store those configurations for immediate recall, everyone has become comfortable with various ways to make the setup their own. There's a tremendous amount of enthusiasm about the Element's programmability.

term this proved a great benefit.

Programming is accomplished by entering the IP address of the node you want to access into your browser. The node then serves configuration screens that enable you to define input sources and output destinations.

Needless to say, this is quite a bit different from analog audio, but with a little

### Welcome reception

The on-air talent has been receptive to the new system. It was a big change going from an analog board to a digital setup like the Element, but the system's ability to provide custom configurations has made everyone eager to learn more.

Documenting our system also has been easier than I'd imagined. I simply captured screenshots of every audio node's configuration page, so I know exactly how our system is configured.

Wiring is based upon a device's IP address as the core indicator for its location and device type. So you know where the device is located physically as well its location in the system, as opposed to looking up a number in a list somewhere to figure out where a partic-

See LIVEWIRE, page 33 ►

## TECH UPDATE

## Lawo Introduces mc<sup>2</sup>56 Production Console

Lawo added the mc<sup>2</sup>56 production console to its mc<sup>2</sup> series of consoles, saying it delivers mc<sup>2</sup> performance with a streamlined surface and compact dimensions.



Based on existing mc<sup>2</sup> technology, the mc<sup>2</sup>56 offers the Lawo HD core with up to 512 DSP channels, 144 summing buses and a routing capacity of up to 8,192 crosspoints. The functionality of the mc<sup>2</sup> series is available, including the transfer of snapshots within the mc<sup>2</sup> family, as well as dynamic automation and networking with other Lawo products.

The control surface offers access to important operating elements. Functions that are rarely used are handled via the touchscreen graphical user interface. The company says this design facilitates operation and a short learning curve.

In addition, the new construction reduces fader width to 30 mm. Every 16-fader bay offers fully featured metering on a high-resolution TFT.

Lawo offers options for a second fader row and the insertion of PPMs (peak program meters). With available frame sizes ranging from 32 to 80 faders and special flight-case versions, the Lawo mc<sup>2</sup>56 is suitable for a variety of applications.

For more information, contact Lawo North America Corp. in Toronto at (416) 292-0078 or visit [www.lawo.ca](http://www.lawo.ca).

# Accessorize

## JK Audio's Beltpack Series Is Just What Your Belt Has Been Waiting For.

Making ultra-compact professional audio tools has always been JK Audio's specialty. Our Beltpack Series takes compact/pro to new levels. Incorporating Bluetooth® Wireless Technology, our **BluePack** and **RemoteAmp Blue** provide wireless connectivity, via your cell phone, to just about any place you need to be.

**BluePack** allows field reporters and remote talent to conduct live man-on-the-street interviews through a cell phone equipped with Bluetooth. Mix the mic input (balanced XLR) and the 3.5 mm aux send for a 3.4 kHz station feed back through your phone (via Bluetooth) and/or grab a full-bandwidth mix from the stereo output to the recorder of your choice. Its professional microphone preamp and powerful headphone amp deliver the highest quality audio.

**RemoteAmp Blue** allows IFB monitoring through a cell phone equipped with Bluetooth Wireless Technology. This is a listen-only device designed for voice IFB or full-bandwidth stereo music listening. The line input jacks and separate volume controls allow wired operation in parallel with the Bluetooth connection.

**RemoteAmp Two** provides a wired, listen-only connection for mono IFB or full bandwidth stereo music listening. Separate volume controls for the XLR and 3.5 mm line input jacks allow a simple mix of mono and stereo sources.

Each has a powerful 1/2 watt stereo headphone amplifier that will cut through any crowd noise. **BluePack** and **RemoteAmp Blue** also pair to Bluetooth-equipped sound cards and music players in full-bandwidth stereo A2DP mode.

This season, make sure you're properly accessorized with JK Audio's Beltpack Series.



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World Radio History

USER Q &amp; A

# SAS: Working 24/7 for the Live Jocks

## Clear Channel Turns to Sierra for Its Big Cluster Project in New York City

Josh Hadden, director of engineering and IT for Clear Channel Radio—New York and Long Island, comments on his recent experience with **Sierra Automated Systems**. Questions are by RW.

Clear Channel chose an SAS console/routing system for the big cluster consolidation in New York. Why?

I did research for several years prior to the actual purchase, and watched as consoles emerged from the analog realm to the now-common router back-end, console-as-mouse-and-keyboard front end.

I have always been an admirer of SAS. Being a closely held company makes them able and willing to add features or tweaks quickly, a tremendous plus in an environment where my dayparts are still live. It's not about whether the thing works with a playout system so much as it is about how it works for a live jock.

More important, SAS gear has been bulletproof in my nearly 20 year experience with it.

When we consolidated, I removed from service a perfectly good 32000 router that had been running 24/7 since 1994 from WKTU(FM), and another 32000 Intercom frame from 1995 from WWPR(FM). Not a single problem ever with either of them.

Also, when I replaced my Zaxcom consoles at Z100 [WHTZ], I did so with SAS for the reasons above, so I had several years of Rubicon/Rio/32KD [experience] under the belt at the insanely aggressive and demanding Z100.

What other services did SAS provide?

SAS provided on-site installation and technical support, and continues to do so. It was part of the package, as was, of course, pre-installation design and tweaking.

What are the parameters of the system? What hardware did you choose, how many studios, how many surfaces, what is the routing capacity, etc.?

I went with 10 32-channel Rubicons in

each of my air studios, six 24-channel SLs in my station production support studios and 16-channel SLs in three commercial production studios. Several Rubi-Ts fill out my voice track and traffic studios.

I have six 32KD frames on the back-end in MCR supporting 29 studios total. The routing size was so large that SAS had to rewrite its code so it was more



Hadden likes the SAS system's ability to share back-end devices like IP and ISDN codecs, 'and the ability to pull a single module if we need to.'

**The jocks shouldn't have to get used to anything different. The improvements are either under the hood, or easily hidden from them.**

efficient across this many frames and input/outputs. The system has more than 3,000 crosspoints, and the flashing lights are beautiful ... as long as they're not red, of course.

You told RW earlier that you decided against using an IP infrastructure system. Can you expand on why you made that decision?

In my case, an IP infrastructure didn't buy me any less maintenance, any more features or any lower cost. It does not make troubleshooting any easier, would not make anything sound better.

Audio over IP is certainly a viable alternative, and has plenty of neat fea-

tures that could be implemented in the future, but was not compelling to me.

Who configured and installed the system?

The system was configured and installed by SAS, Technet and my staff as we got familiar enough with it to do so.

How do control surface functions and features differ from what the station staffs were using before?

That's the beauty of a powerful system — the jocks shouldn't have to get used to anything different. The improvements are either under the hood, or easily hidden from them, so all they see is a console with faders, pans, bus assigns and meters like they've been using for their whole career.

What other benefits have you appreciated?

The ability to share back-end devices like IP and ISDN codecs; the ability to pull a single module if we need to; on-the-fly reconfiguration of the console; and intelligent mix-minus and integrated intercom are a few. Of course having a system where I can have local audio sources (CDs for example) in the studio and wire them directly to a Rio in the studio instead of having to run back to MCR is nice.

What was the biggest problem or issue you had to solve in integrating so many studios, when it came to the routing system?

Well, the number of outputs was so large that SAS needed to optimize its code so that output modules were no longer aware of every single output in the system; they only needed to be aware of what outputs they were in charge of. Unfortunately this wound up being a major rewrite and optimization project for SAS and resulted in effectively a whole new system.

So, in what I call the pre-commissioning stage, there were bugs to be found, as you'd expect. SAS isolated and fixed any bugs in short order. And while we were bug swatting, we continued adding features that made our jocks lives easier.

What kind of documentation are you using?

The basic documentation is in Excel, but in a format that eventually I'll export to Access, and create an application where we can query the entire wire number/equipment inventory and see the entire "one-line" of a particular device or wire simply by entering any one piece of the puzzle. Instead of having to "continue on p38" everything we want to know will be populated in one place.

Now that the system is in and functioning, what lessons have you learned that would help another user as they set out to plan an installation?

Planning is the most important component for a successful outcome. Even so, something will getcha; be prepared with some reserve resources to deal with whatever the gotcha is.

Another crucial component is the vendors you use for major equipment. You want someone that will help fix and install things, not nickel-and-dime you; a vendor whose word is solid. And of course, involve not only your staff but key stakeholders in other departments. Create prioritized lists with each department on what they need done/fixed/changed and keep them up to date.

For more information, including pricing, contact Sierra Automated Systems at (818) 840-6749 or visit [www.sasaudio.com](http://www.sasaudio.com).

TECH UPDATE

## JK Audio Ships Portable Broadcast Mixer

JK Audio is shipping RemoteMix 4, a four-channel field mixer and headphone amplifier.

More than a field mixer, the communications interface features a phone line hybrid and keypad, a PBX handset interface and a cellphone interface. The portable unit is smaller than a lunch box.

The company says the RemoteMix 4 is for live remotes. Use it as a phone line hybrid, calling into your studio talk show hybrid; as a front-end mixer for your POTS, ISDN or IP codec; or with your laptop codec.

Bass Boost adds some low end before sending the signal down the phone line. A soft limiter prevents overdriving the phone line interfaces, while the mixer XLR output is pre-limiter (full range). Line-level cue input to the headphones makes RemoteMix 4 a suitable companion to a codec.

RemoteMix 4 first attempts to connect in hands-free mode to a cellphone. If this type of connection is not available, it will connect to another product that allows a Bluetooth wireless connection such as a notebook or portable. This wireless headphone mode offers a full audio bandwidth stereo connection.

Features include 3.5 mm send and receive jacks for recording the show or mixing in an MP3 player; and separate headphone level and source selection controls. Monitor only the clean mixer output, or the communication return plus the mix.

Phantom power is not always needed, yet it can be a drain on batteries, according to the company. The phantom power generator only runs if any of the rear-panel 48 V switches are set to the "on" position. Low-noise, low-power ICs are used to preserve battery life.

The included 100-240 VAC desktop-style power supply overrides battery power only when the supply is actually providing power. If the power goes out, the batteries cut in. Use one battery or two. There are separate compartments for hot-swapping batteries.

The JK Audio RemoteMix 4 retails for \$1,395.

For more information, contact JK Audio at (815) 786-2929 or visit [www.jkaudio.com](http://www.jkaudio.com).





USER REPORT

# WVUD Upgrades and Expands With Aeon

*Flexible Control and Routing, Assignment Capabilities Are Among Attractive Features*

**by Dave Mackenzie  
Chief Engineer  
WVUD(FM)**

**NEWARK, Del.** WVUD(FM) is located at the University of Delaware in Newark. The station's facilities include two on-air control rooms and one production studio equipped with Pro Tools, all interfaced to a central Klotz Digital Vadis 880 routing matrix.

Our studios were originally built in 1983. They were very worn by 2002 and we decided to upgrade the studios one at a time.

Our Klotz Spherion ran without a hiccup for more than four years. We loved it and did not want to see it go. In 2005, one Spherion console and two other consoles were upgraded with three Klotz Aeon console systems.

We looked for the ability to control and route audio to any studio and control audio feeds to the FM station, cable station and two Internet feeds; the ability to assign audio sources to the channels of the console to reduce size of the consoles but not reduce functionality; an all-digital routing platform we could extend in the future to the transmitter site; and a system that could be understood quickly by our large student and volunteer staff of about 100 people.

**Familiarity breeds content**

When we decided to upgrade the rest of our facility, the Aeon was recommend-



Student DJ Nathalie Antonov and WVUD's Aeon.

ed because it used the same routing technology, and our existing system's audio engine could be converted into the new router.

We liked the operation, look and feel of the Aeons. Students like the ability to control dynamics and EQ on the channels. Snapshots have made it easy for students to get the console configured quickly for their shows.

Having the ability to change the audio assigned on the board has given us the flexibility of a larger console without taking up all the counter space. The ability to route and control our remote codecs to any studio and have integrated mix-

minus assignment and talkback assignment is wonderful. Students do more remotes than ever now because it's easy to assign the remote to any studio.

WVUD's platform also includes Klotz's Octo-Bus technology, which allows expansion of the system's input and output count by way of modular units that connect to the audio engine with standard Cat-5 cable.

The Octo-Bus network's modular architecture gave us additional flexibility to accommodate the integration of new and existing hardware. Any combination of up to 16 input and output boxes can be daisy-chained on one Cat-5 cable. This connects to one of the four RJ-45 connectors provided on the Vadis Octo-Bus interface card.

See WVUD, page 34 ▶

## Livewire

▶ Continued from page 30  
ular wire goes or comes from. This was far easier than documenting our previous analog setup.

The entire concept of this system is fantastic. The ability to have so much control over signal routing and console configuration is impressive — not to mention the system's flexible GPIO options.

Axia's scalability will serve us well in the future. We are approaching a new construction phase here on campus, which for us will likely translate to a new KWMU building with seven main studios and four or five additional news editing studios. With its Ethernet-based infrastructure, our Axia system is ready to grow along with us.

The Element consoles have the functionality and feel a good console should have, but with the added benefit of being highly programmable and configurable. Most important, the audio quality sounds terrific.

Our studios were made operational on Jan. 1, 2005, shortly after the launch of Axia itself. Being on the edge of the early-adoption curve, we experienced some minor software issues early on, but the system has been stable and functional since. In fact, most studios have been running for more than a year — since our last software update.

For more information, contact Axia Audio at (216) 241-7225 or visit [www.axiaaudio.com](http://www.axiaaudio.com).

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SINCE 1963

## USER REPORT

# EiTB Installs Arena, BC-2000D in Spain

## AEQ Consoles Simultaneously Control Monitored Audio, Signaling and Muting for Multiple Studios

by **Goio Torrontegui**  
**Technical Service Manager**  
**Radio Euskadi**

**BILBAO, Spain** The EiTB group is the leading media group in the Basque Country, with four television channels and five radio stations. It has been in operation since 1982.

Recently in our new EiTB headquarters, AEQ finalized the start-up of the one of the largest and most complete installations of digital studio radio equipment in Spain, with advanced technology based on AEQ's Arena consoles, BC-2000D matrixes and Systel Multi-conference System.

EiTB broadcasts its programs from these new headquarters in Bilbao, but also contributes and distributes its own signals to the territorial broadcast centers of San Sebastián, Vitoria and Pamplona.

Essentially, the EiTB facility consists of the following technical spaces: a central control room where the AEQ BC-2000D digital router and the entire AEQ Systel 6000 communications management system are installed; a main studio that is divided into two smaller studios; four control studio facilities; three studios in self-control format; and four recording booths.

The main control room's two studios are for news and programs. Both studios are equipped with an AEQ Arena mixer, with 25 and 15 faders, respectively.

### Multi-studio control

Controls 2, 3, 4 and 5 also are equipped with 25-fader AEQ Arena mixers, while self-control facilities 6, 7 and 8

are furnished with 15-fader AEQ Arena mixers, and the four recording booths with the same mixers, but in a five-fader configuration.

The AEQ Arena consoles offer control of monitored audio, signaling, cough



Goio Torrontegui, left, and AEQ engineer Javier Ferrer work with Radio Euskadi's AEQ system.

muting, etc., required in a radio studio. In addition, several studios also can be controlled simultaneously while maintaining the independent signaling operations.

The composition of the consoles includes a frame rack for the insertion of all the audio boards, process DSPs and system controller, as well as a redundant power supply unit and a modular control

surface. The link between frame and surfaces is via IP. Each surface and each frame has a different IP address, so it is possible to connect any surface in the station with any control frame.

The AEQ BC-2000D router is an audio matrix designed for the most demanding operation, in terms of both reliability and maintenance. With a capacity of 1,024 x 1,024 audio signals

(100 percent summing/distributing), the AEQ BC-2000D router matrix uses the same hardware as in the AEQ Arena console, a feature that eases maintenance.

The EiTB configuration requires that the audio inputs and outputs are made through AES/EBU connections. For this reason, only two types of audio connec-

See ARENA, page 36 ▶

# WVUD

▶ Continued from page 33

Octo-Bus is a bidirectional protocol, enabling any combination of input boxes, output boxes and other available control devices to be arbitrarily connected to Cat-5 bus cables.

Once the Octo-Bus units are connected, the Vadis control software manages the signal distribution. All inputs can be dynamically assigned to any combination of output devices either on the same bus or any number of busses. Additional output devices can be added to provide signal splits and distribution of a single input.

The main challenge was replacing the networked Spherions with the non-networked Aeons. Distributed routing functions that had been performed over a network were reconfigured so studios could switch airchains without relying on Ethernet to pass commands back to the routing matrix.

**The main challenge was replacing the networked Spherions with the non-networked Aeons.**

"The GPI switching scheme was really quite interesting," said Scott Johnson, director of engineering for Klotz Digital and chief project engineer for the WVUD upgrade. "Utilizing Klotz's Configuration Script Language, we often use the SHARE (resource sharing) functionality of our Vadis software in order to allow studios to do request/release switching.

"When a studio wants an airchain that another studio has, the operator presses a request button and lamps flash in both studios. When the operator in the other studio presses his flashing button, the airchain is released to the requesting studio.

"First, I implemented the share functionality on that router to make the air chains shareable, as in a networked system," Johnson said. "Then I assigned the share's virtual buttons to GPI inputs and its lamps to GPI outputs. The router GPIs were connected to the GPI inputs and outputs of the three studios.

"On each Aeon, these buttons and lamps were associated (using the Aeon Setup Tool GUI) to user-configurable buttons on the Aeon surface. This allows the request/release functions to behave just as they would in a more expensive networked system," he said.

This project exemplifies how the Aeon fits into a variety of environments by offering modular connectivity and fast, efficient custom configuration. The Aeon system assures WVUD years of versatility, reliability and value.

For more information, contact Klotz Digital at (678) 966-9900 or visit [www.klotzdigital.com](http://www.klotzdigital.com).

## TECH UPDATE

## Arrakis Debuts ARC-10 Series for On-Air, Production

The ARC-10 series of radio consoles from Arrakis is suitable for on-air and production studio applications. There are three models to choose from; all have the same front-panel operation and differ only in the input sources they accommodate.

Two of the models (ARC-10U and ARC-10UP) support consumer-style source equipment with off-the-shelf cables, intended to make installation as easy as that of a home stereo system. The third model (ARC-10BP) supports balanced pro sources that may require custom cables.

Features common to each model: Mic channels 1 and 2 are balanced XLR with optional phantom power; program output is both balanced XLR and unbalanced RCA; and the telephone channel (Ch. 10) is balanced in and out with logic.

Channels 1 and 2 are high-performance mic channels for on-air talent with a guest. Channel 10 is an advanced telephone interface to an external hybrid for live callers or an off-line contest call. Seven stereo line input channels handle other audio sources found in most studios, such as CD players.

Channel 9 can be optionally configured with a Windows PC USB interface for use with live on-air, automation and production software (free Digilink-Xtreme software in ARC mode is included).

Additional features include two stereo program output mixes (with mono mixdowns), 10 input source channels, optional 16 in x 3 out stereo remote select switcher and two mic channels and 48 V phantom power (optional). Also offered: LED switches; long life faders; and electronic switching of audio signal paths.

The ARC-10U unbalanced model retails for \$1,599. The ARC-10BP balanced model retails for \$2,495.

Arrakis' latest console for on-air and production, the 15-channel ARC-15, features five mic channels, phone input channel for interfacing to an external hybrid and four VU meters. The USB sound card channel can be interfaced for play/record to a Windows PC. It retails for \$3,495.

For more information, including pricing, contact Arrakis at (970) 461-0730 or visit [www.arrakis-systems.com](http://www.arrakis-systems.com).



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- \$ Omnirax Innova is designed to maximize ease of integration. By listening and responding to engineers' needs for simplicity of integration and maintenance, we have proven to be "The Engineer's Choice".

### STRATEGIC GAIN

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- 🔑 As your team member, your interests are our interests! We collaborate well with any vendors, integrators, architects, program directors & talent, with whom you wish us to work.

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*Quotes are from various wonderful customers; the pictures are of Clear Channel in New York City 2008*



*"I was impressed with the exceptional care given packaging for shipment. A few very large and potentially fragile components made it cross-country completely unscathed."*

*"I appreciate all the work you did, the studio looks FANTASTIC!  
The furniture went together very easily and looks awesome."*



Corian™ solid surface example from NAB 2007

*"The Omnirax design makes these studios incredible for talent and operators on both sides of the console."*



*"Our furniture from you not only fit into our budget and timeline, it was very well constructed and looked beautiful. I expect to be outfitting many more facilities with Omnirax."*

## USER REPORT

# Logitek Consoles On-Air in Bellevue

*Community Station in the Seattle Metro Takes Advantage of College Housing*

by Sam Roffe  
Engineering Director  
KBCS(FM)

**BELLEVUE, Wash.** KBCS(FM), a non-commercial community radio station in the Seattle metro market, is licensed to Bellevue Community College in Bellevue, Wash.

Our on-air hosts are volunteers, and day-to-day operations are supported by a few paid employees. We have a variety of programming such as jazz and folk, world music and some hip-hop.

We also have a growing public affairs department to provide grassroots news programming not heard anywhere else in the Seattle area.

Because our on-air offerings are so diverse, we have a need for broadcast equipment that offers good flexibility in setup and reliable operation.

## House Five

Our facilities have used Logitek audio routers and consoles for many years. When I joined KBCS six years ago, a Logitek ROC-10 console was (and still is) in use.

About two years ago, we installed a Logitek Remora-10 console with a newer Audio Engine, and as this article is being written, we are awaiting delivery of a third Logitek console system, a Remora-16 and two Remora-4s for a studio expansion project.

The current Remora-10 installation is our primary system for on-air operations. In the main studio we have four microphones for our DJ and any interviews or small performances.

Being a community radio station, our volunteers have the freedom to choose their music selection. Our music programming is done off of CDs, but we also operate an ENCO automation system that replaced MiniDiscs for PSAs, promos and underwriting announcements.

We also use our ENCO system to run our automation during the few hours a night we run unattended. KBCS also is an advocate of vinyl so we still maintain a couple turntables both for the traditional folk music and jazz as well as evol-

ving hip-hop music.

The KBCS studios are located in a residential house that the college provides us. We are operating our studios in one house and will soon be expanding to another house. Our current on-air studio and primary production studio, located in House Five (the college's name for the house), used to be bedrooms.

When we started our relocation project a couple years ago, we took out the closets that shared a common wall, removed the wall and put in a sound barrier wall with an acoustic window in it. We had to replace the single-pane windows on the exterior with double-pane.

In House Five, the primary studio and production studio are running off the two existing Audio Engines. In that facility we also have a couple analog boards running independent audio workstations.

The audio engines are in a central location in engineering racks on the other side of the house with cabling running between studios through the attic, terminating on punch blocks. The engineering racks also hold our satellite equipment.

The new studios we have been eagerly anticipating for two years also are going



The Logitek system suits KBCS's on-air hosts and operations staff, consisting of volunteers and a few paid employees.

**The networking of the two buildings will allow us to share audio resources such as our satellite feeds, ISDN and POTS codecs and phone system.**

to be in a residential house the college has given us, located across the street from House Five. That's where the new Audio Engine with the Remora-16 and two Remora-4s will be located.

These new studios are being built in the basement of the house so we didn't have to knock down any walls and are utilizing the concrete walls to help with soundproofing. The equipment rack will be located in another part of the basement.

processes, and is connected with the rest of the frames through dual MADI boards capable of managing 128 time slots of the general system TDM bus.

The rest of the frames support MADI communications with the 13 AEQ Arena consoles, and the digital audio boards for the signals in the system (32 per studio and 16 per recording booth), including the 40 ISDN lines coming in from the Systel 6000 communications manager.

Now that we have completed startup of the Radio Euskadi facilities, and in the light of the operational outlook for these first months, we wish to convey our satisfaction with the equipment supplied to us, which includes 13 Arena BC2000D consoles, the BC2000D 1024 x 1024 matrix and its eight terminals, as well as the Systel 6000 system.

For more information, including pricing, contact AEQ at (954) 581-7999 or visit [www.aeqbroadcast.com](http://www.aeqbroadcast.com).

pick the feed they wanted to listen to on a single pair of cables coming to that workstation.

The new studios will be directly linked to the existing Remora-10 system with fiber (a fiber run was already in place, which saved us some time), and it will be easy to directly route audio chan-

nels from one to the other studio across the street.

With the two Audio Engines located in separate buildings, the capability of linking the two was a strong consideration in the purchase of the new Logitek system. The networking of the two buildings will allow us to share audio resources such as our satellite feeds, ISDN and POTS codecs and phone system.

I love the concepts of the router-based mixing systems and I look forward to spending some time with Logitek's scripting language (Command Builder) designing new ways to make our operations even more flexible. We under-utilize the capacity of our Audio Engines; we could really benefit from their capabilities. All in all, we're pleased with the Logitek systems and have gotten reliable operation and great customer support over the years; we can't wait to get our new studios on the air.

For more information, contact Logitek Electronic Systems at (800) 231-5870 or visit [www.logitekaudio.com](http://www.logitekaudio.com).

## Arena

► Continued from page 34

tion boards are used: AES/EBU input/output and MADI connection boards capable of transporting up to 64 input and output audio channels. One of these MADI boards was installed for each of the studio consoles.

The AEQ BC-2000D router central control matrix has the security elements required for correct system operation: silence detectors, redundant power supply and controller, alarm notifications, hot swapping of audio boards and cooling fans and backup system in the process DSPs.

Physically, our matrix, supplied by AEQ, consists of a main frame and four satellite frames. The main frame performs and manages the main functions of the matrix, crosspoints, additions and

## Coming up in Buyer's Guide

**Audio Transport, Codecs, Telco, Internet, Satellite & STL**

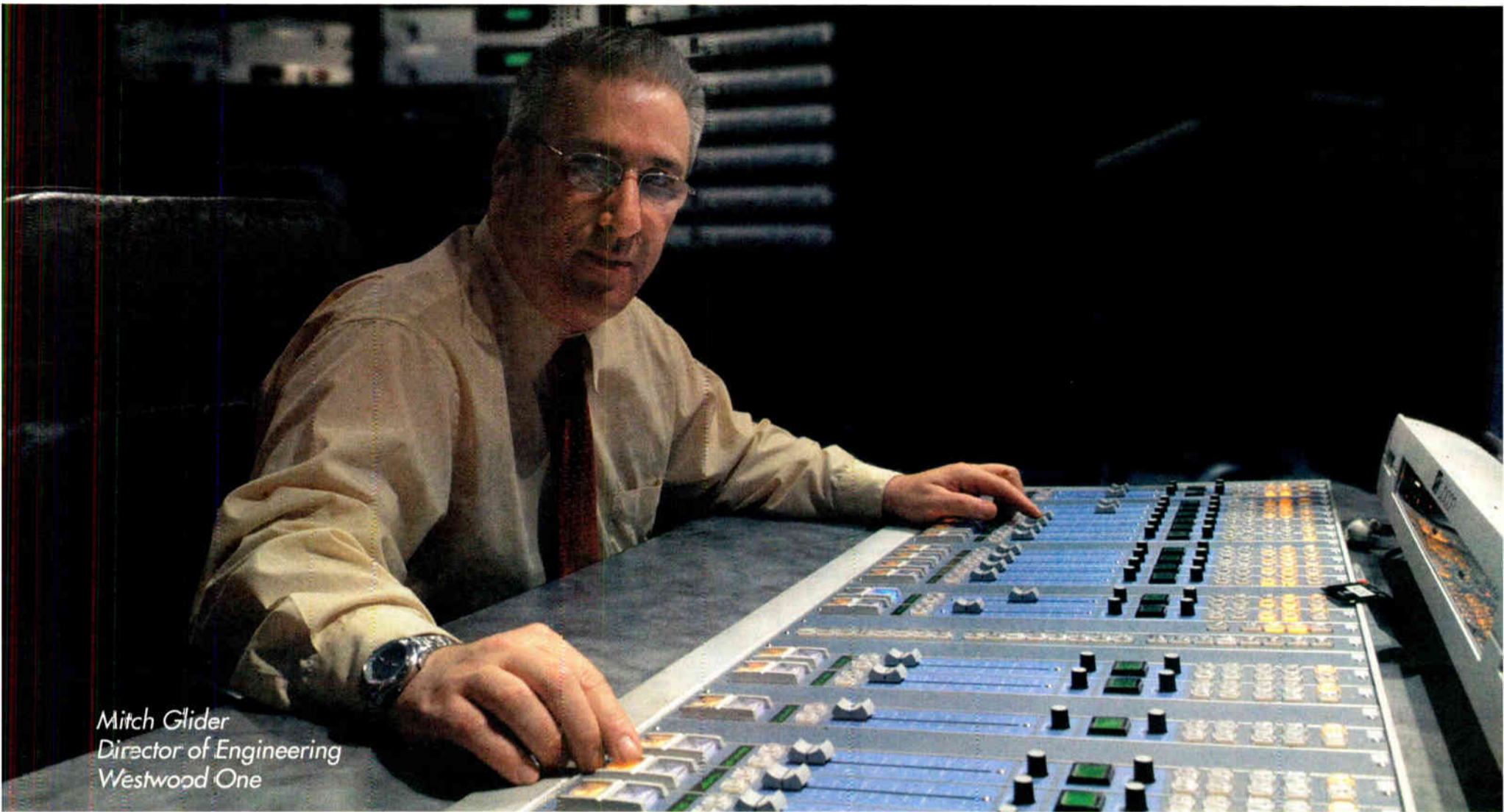
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**Studio Acoustics, Design & Furnishings**

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September 24



Mitch Glider  
Director of Engineering  
Westwood One

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USER REPORT

# Clear Channel Chooses E-6 for FM Stations

## Wheatstone System Selected for Its Features And 'Well Laid Out' Construction

by **Jim Graham**  
**Chief Engineer**  
**Clear Channel Radio —**  
**Greenville**

**GREENVILLE, S.C.** As the time drew near to remodel the furniture and on-air console for three of our four FM stations, we decided to install the Wheatstone E-6 system.

After the engineering and programming staffs examined the E-6, we felt the features and construction were well laid out, and that this was a console system

that would satisfy the needs on our on-air talent and provide dependability and ease-of-service.

Thanks are due to Phil Owens from Wheatstone, who visited our location and brought an E-6 for us to examine.

Our regional VP of engineering, Ben Brintzer, recommended Jim Hibbard of Pacific Mobile Recorders to install the Wheatstone system. At Jim's recommendation, we used Vince Fiola's Studio Technology studio furniture.

All of this has worked out very well. The furniture is beautiful and well con-

structed, and allows easy access to the equipment.

### Service in place

With any new system there is a learning curve, and the Wheatstone E-6 system has an easy one for installation and operation. And when we had questions, Wheatstone's staff was responsive and eager to resolve any issues.

mono or stereo, label and assign inputs to any channel. The output is the same. We are able to route recording busses, monitoring and mix-minus easily.

As music stations, we don't do a lot of switching around. But the times we've needed to it was a breeze. All muting, inputs, outputs and metering can be configured any way the user desires. With input from programming, we closely matched the previous console layout for ease of transition for the air talent. Training was quick and easy for the talent. We trained one person per station



Roger Davis, news director for WESC(FM), and the station's Wheatstone system.

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I was impressed with the construction and how the console could be disassembled for repair if needed.

The E-6 surface can be turned off and worked on while the last selected source will stay on the air. With today's automation, that makes it less stressful for the engineer maintaining this console system.

and that person shared the information.

I like the clean layout of switching and labeling on the E-6 surface. It looks like a console, but it's actually controlling the Satellite Rack Mount Cage.

The E-6 gives us a state-of-the-art look and feel in our new air studios. The control surface provides a flat, low-profile console with no meter bridge. Instead, metering, the clock/timer and other console functions are on a PC monitor (provided locally).

We chose a 17 inch flat-panel to reduce the impact of clutter in the studio. We find some features to be more convenient than we thought, such as the PC software "WSTimeset," which keeps the studio clocks accurate and synchronized to our NexGen automation.

We are getting ready to replace the furniture and console in the fourth FM studio and the new E-6 is already here. Our talent loves the new consoles and I'm happy with the Wheatstone equipment.

For more information, contact Wheatstone at (252) 638-7000 or visit [www.wheatstone.com](http://www.wheatstone.com).

**I was impressed with the construction and how the console could be disassembled for repair if needed.**

It's handy to be able to choose a mono or stereo feed (installation) for each input and, for the operators, the E-6 surface input selection is simple and flexible. We greatly reduced the amount of wiring, as we now have the ability to feed any rack-room source to any console input without an individual wire pair having to be run to a given studio. Using the Satellite-E Rack Cage and the pre-wire to Krone Blocks made for a clean installation.

The system's inputs and outputs are flexible. Once wired, the Xpoint (Crosspoint) software is used to set up

## Workbench

by John Bisset

**Every Issue**  
**Radio World**

USER REPORT

# Cox Outfits 'Rick and Bubba' With Harris

*New Facility Features Harris Consoles, On-Air And Production Tools and VistaMax Audio Networking*

by Tom Scott  
Chief Engineer  
WZZK(FM)

**BIRMINGHAM, Ala.** "The Rick and Bubba Show," on the air since 1998 and heard nationally on more than 50 stations, recently joined the lineup at Cox Radio Birmingham's flagship station, WZZK(FM).

The show was moved to a new broadcast facility in Vestavia Hills, Ala., to develop a complete morning show experience that includes a live band performance area, audience seating in the studio and an exterior broadcast plaza area for public viewing of the studio space while the show is on the air.

The new 5,000 square foot facility, which opened in March, features a complete digital studio solution from Harris including VistaMax audio networking, studio consoles, furniture and various tools for the

Haaster worked with me and the station's contractor to manage the architectural, interior and acoustic design considerations.

The Harris RMXdigital was the choice of console for the on-air studio, partially based on my experience with analog RMX consoles at Cox Radio Birmingham. The RMXdigital features six mix/minus busses that prove convenient for remote broadcasts. The busses are programmed into the system, so the operator can avoid punching in a matrix of channels. Four assignable program busses allow the operator to feed audio around the facility, including a set of speakers outside the studios.

The on-air operation includes a Telos Two x 12 interface drop-in within the furniture surface for bringing phone calls live to air. Harris also provided several of its World Feed Panels to accommodate laptops and other non-traditional source equipment.

Speedy, one of the show producers, typically



Intern Bobby Boucher; hosts Rick Burgess and Bill 'Bubba' Bussey; and producer Don Juan Demarco, from left.

on-air and production operations.

The facility inhabits a preexisting office complex that was gutted in preparation for the design and integration process. Featuring spacious studios for on-air, production, video control and call screening, the facility provides a fully functional digital studio with an eye toward future growth.

Expansion is accommodated through the installation of the Harris VistaMax audio networking system, the centerpiece of the studio solution.

## Solid communication

The station installed the VistaMax system as opposed to the less complex VistaMax Envoy system, which is designed for smaller studios. The additional space on the system leaves plenty of room for upgrades, including the potential to link the new site with our Birmingham headquarters via fiber connectivity once the latter site upgrades to digital studios.

The VistaMax mainframe and associated processing gear resides in the technical operations center, and communicates with our TI link for program transport to New York for national satellite distribution, as well as our IP connection to the Birmingham headquarters for local distribution.

The system considerably reduces facility wiring with clean, centralized routing to and from VistaMax and studio destinations.

Each studio features Harris Smoothline furniture to match the size of the operation while providing a visually appealing presence for TV station cut-ins planned for the near future. The on-air studio is the life of the operation, with plenty of space for the four show players and several guests.

Nick van Haaster from Harris conceptualized a venue-like atmosphere in the studio that incorporates a separate space to host live bands and accommodates seating for in-studio audiences. Van

plugs his laptop directly into the panel. He simply cues the audio and drops it right into the live mix, and it sounds fantastic.

The World Feed Panel also is ideal for external camera crews. Pre-delay audio feeds to synchronize audio with video from the camera crew are easily assigned over a program bus for camera.

A final but significant benefit of the RMXdigital is its stature as a standalone console. This is important to program redundancy, especially as a syndicated program.

The console can immediately go online in a standalone configuration should VistaMax be taken offline for any reason. Most sources are wired directly to the console for this reason, including the automation system, an Allen & Heath mixer for live band performances, microphones, ISDN equipment and traditional source equipment such as CD players.

The RMXdigital also includes a full-blown intercom feature that allows players outside of the on-air studio to contribute to the on-air program.

The show's Webmaster, Ryan Greenwood, often contributes to the show over the intercom, which is picked up by the microphones to create a "drive-through" audio effect. Intercom stations also are present in the screener room, production studio, TOC and TV control area.

The production studio features a Harris NetWave eight-channel mixer (NetWave-8) that was initially selected for its lower price point. The original vision includes a dubbing room as opposed to a full-blown production studio, and at this point nearly 75 percent of production happens in the on-air studio.

However, we have used the production studio more than planned, and the NetWave-8 has proven to be a powerful production console for the operation.

The NetWave-8 serves as an edge device for VistaMax, with three channels used for external audio source selection, and several more to route

sources to and from the automation system. It is traditionally set up to reproduce the automation system output, but we occasionally pull in the RMXdigital feed or other sources to record audio.

VistaMax is essential to routing these sources around the facility. The "Rick and Bubba" show element is dynamic, and it's difficult to predict how they will use audio sources from day-to-day, be it a laptop, TV feed, production or something from the archives. VistaMax addresses this need by allowing the hosts and producers to pull up any source in an instant and play it over the air.

And, with the possibility of TV looming, the Harris team designed an exceptionally visual studio for showcase appeal on the air, from the Smoothline furniture to the projection screen to the "Rick and Bubba" branding wall.

For more information, contact Harris at (513) 459-3775 or visit [www.harris.com](http://www.harris.com).



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## USER REPORT

# Jazz Network Packs SixMix for the Show

*Henry Engineering's USB Broadcast Console Selected for Live Coverage of Music Festival*

by **Bernie Celek**  
President  
Arizona Jazz Network

**SEDONA, Ariz.** The Arizona Jazz Network is an Internet broadcast station with a contemporary jazz format. On the air since early 2008, our music library includes more than 7,000 CDs from current artists, as well as those from the early days of jazz.

Our wide range of music was one of the reasons that Arizona Jazz Network was selected as the "official voice" and broadcast outlet for the six-day Sedona Jazz Festival scheduled for Sept. 23-28.

We've been chosen to provide live coverage of this popular music festival, which requires us to build a fully functional "satellite" studio that can be transported easily and set up at the festival location in Sedona. Because we'll be broadcasting live, we also need a way to get the audio signal back to our main studios in Cottonwood, Ariz.

## On location

I selected **Henry Engineering's** new SixMix USB broadcast console to be our main remote audio console. This unit is perfect for our remote studio. It's compact and easy to use, and will handle all the source gear we'll use at the festival.

Our "Sedona studio" has been built into a portable rack case.

There are three mics, two Teac Pro-01CD players and a Marantz PMD671 flash recorder. Because the SixMix console has two mic inputs, I use an external mic preamp for the third mic and feed it into (line) channel 3 on the mixer. The CD players are for music playback, and the flash recorder will be used to record artist interviews during the shows. We'll also take a stereo mixdown from the live stage mixer for putting live performances on the air.

Our RE-20 mics are used for the show's host commentator, jazz historian and other announcers. We have three of Henry's MiniPod headphone amp modules for the announcers. They connect directly to the SixMix, so each announcer has his own headphone jack and volume control. Our broadcast booth uses JBL 4310 monitor speakers, fed from the Monitor output of the SixMix.

Although the Sedona Jazz Festival is a few months away, we've already built the remote studio and have had it in use for a few weeks just to be sure everything is working okay. And it is.

The SixMix is an awesome mixer. It might appear simplistic, but there's lots more "under the hood" than what you see from the outside. The Monitor output



Host Debbie Celek uses a SixMix console for remote broadcasts of the Sedona Jazz Festival.

back of pre-recorded segments, and to record some parts of live performances. The SixMix codec overrides the sound card in the laptop, and sounds much better. After recording an interview using the Marantz PMD671, I just unplug the compact flash card, plug it into the laptop and edit the interview as needed.

The edited interview can then be played directly from the laptop via the USB connection to the SixMix. It's efficient and quick ... and sounds great.

The SixMix has a stereo analog Program output that I feed into a Barix Instreamer 100, which is connected to a high-speed Internet

connection. This produces a digital feed to our main studio in Cottonwood, where a Barix Exstreamer 100 receives the remote site IP audio and sends it to our digital Harris console.

Although the SixMix is really intended for use in a conventional studio setting, it makes a superb remote broadcast mixer. It's about the same size as my laptop, and is much easier to operate than the "garage band" mixers that I've used for live remotes. When you're on the air doing a live show, you don't need scores of tiny knobs to add confusion and complication.

The SixMix obviously is designed for broadcasting, not for mixing PA system audio or a multi-track recording session. It does what a radio station console should do, such as turning on the "On the Air" warning lights, and providing a mix-minus output for your telco hybrid.

I did a quick audio proof on this unit, and was impressed that the noise floor is almost 90 dB below the normal operating level, which is +4 dBu on the balanced Program outputs. It sounds great.

The SixMix would be a great choice for anyone needing a compact yet capable broadcast console for a small on-air studio, production or news room, college radio or Internet radio as I'm using it. I've been impressed with its feature set and performance. Tune in to our live broadcast in September and take a listen for yourself: [www.azjazz.net](http://www.azjazz.net).

For more information, contact Henry Engineering at (626) 355-3656 or visit [www.henryeng.com](http://www.henryeng.com).

**Although the SixMix is intended for a studio setting, it makes a superb remote broadcast mixer. It's about the same size as my laptop, and is much easier to operate than 'garage band' mixers.**

mutes when the mics are on, so there's no feedback in the booth when the mics are live.

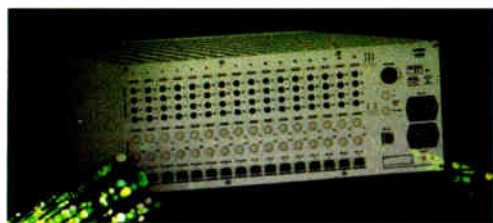
The Cue speaker is loud and clear. It also mutes when a mic is live, yet the board operator can cue (preview) sources through his headphones when the mics are in use. There are six mixing pots (with nice big knobs), but each channel has two inputs (A and B) so you actually have inputs for eight stereo line sources.

## Cool stuff

The coolest feature of the SixMix is its built-in USB codec. I'll be using a laptop with the SixMix for play-

## TECH UPDATES

### Klotz Debuts Multi-Format Audio Router



The Venice audio router from **Klotz Digital** is suitable for applications where many channels must be routed and a comprehensive system is required, for example in large broadcast centers and switching rooms.

Venice offers a routing capacity of up to 2,624 by 2,624 channels. An almost unlimited router size can be achieved by cascading multiple units, according to the company.

It supports optical and coax MAD1 standard protocols as well as Klotz's Vadis fiber optic network. The StudioNet Octo-Bus also is supported as well as the new IT standard for audio and video platforms, "Ethernet AV" (IEEE 802.1 AVB).

Venice is acting as a central star point in decentralized and networked multimedia platforms and is combining various standards and protocols to an intelligent integrated media network. It has synchronization capabilities including AES sync, word clock in and word clock through.

Principal functions are controlled via LEDs, status display and an Ethernet port, allowing Venice to be integrated into the Vadis control network. This includes integration into Vadis software, offering the benefits and workflow efficiencies provided by Vadis Workflow Tools.

Venice is compatible with other Klotz Digital components and technical equipment, such as Routing Control Panels (RCP), Vadis D.C. II and Decennium.

For more information, contact Klotz Digital at (678) 966-9900 or visit [www.klotzdigital.com](http://www.klotzdigital.com).

### Aphex Adds Distribution Hub to Anaconda

**Aphex Systems** expanded its Anaconda digital snake system with the Model 824 distribution hub, which allows users of the system to transmit signals to up to four receivers, and includes the same redundant fiber connections and power supplies.

Anaconda is a point-to-point 64-channel bi-directional digital audio snake. It comprises two identical units on either end of a high-speed fiber run; there are eight ADAT optical inputs and outputs on each unit.



Model 824 is built of eight fiber transceivers. There are two rows of four transceivers each. The first transceiver connects to the long fiber run. The second transceiver is a "through" with both transmit and receive connections between the first transceiver and a local Anaconda Model 828. The third and fourth transceivers are "transmit" only for connecting to remote Model 828 Anacondas.

The second row of transceivers is identical to the first row, and can be used as an independent Anaconda system or as a redundant system for the top row. If there is a break in the receive side of either of the first or second transceivers, the transmitters of those receivers will be turned off, resulting in the Model 828 automatically switching to the secondary row of transceivers on the Model 824.

The Model 824 Anaconda distribution hub has an MSRP of \$1,495.

For more information, contact Aphex Systems at (818) 767-2929 or visit [www.aphex.com](http://www.aphex.com).



TECH UPDATE

## Studer Shows Compact OnAir 2500

Studer's new OnAir 2500 console is intended for on-air radio use.

The digital, "all-in-one" design means the control surface, I/O breakout, DSP core and power supply are integrated within one compact chassis.

The system also includes software technology derived from the OnAir 3000.

The desk's fader strips each include a graphical OLED screen, which contains a channel label, level and gain reduction meter and parameter readouts, adjustable via a rotary encoder and two push buttons below the display.

The wider viewing angle and higher definition of OLEDs enable operators to see immediately and more clearly, according to the company.

The large TFT color touchscreen uses Studer's Touch 'n' Action system, where only the most important functions have hardware control elements in the channel strip.

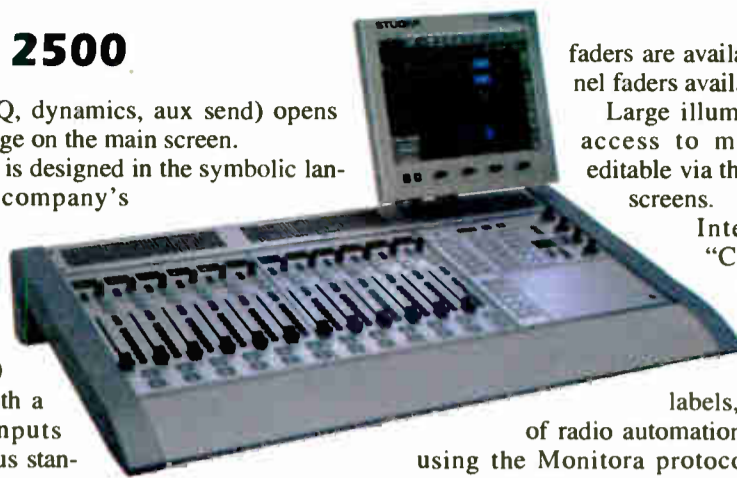
The touchscreen also can display relevant settings and configurations for each channel in addition to the OLED displays. A touch on any of the eight small channel

pushbuttons (e.g. EQ, dynamics, aux send) opens the corresponding page on the main screen.

The user interface is designed in the symbolic language used in the company's Vistonics system, and adjusted in a flat hierarchy without the use of multi-level menus.

The OnAir 2500 provides the user with a large number of inputs and outputs in various standard signal formats. As well as interfaces on XLR and SUB-D outlets (microphone inputs, headphone outputs, line and AES I/Os), the internal audio system offers interfaces to digital multi-channel formats such as MADI, ADAT and IEEE-1394 Firewire.

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faders are available, with motorized channel faders available as an option.

Large illuminated pushbuttons allow access to main channel functions, editable via the 12-inch color TFT touch screens.

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For more information, contact Studer USA/Harman Pro North America at (818) 920-3212 or visit [www.studer.ch](http://www.studer.ch).

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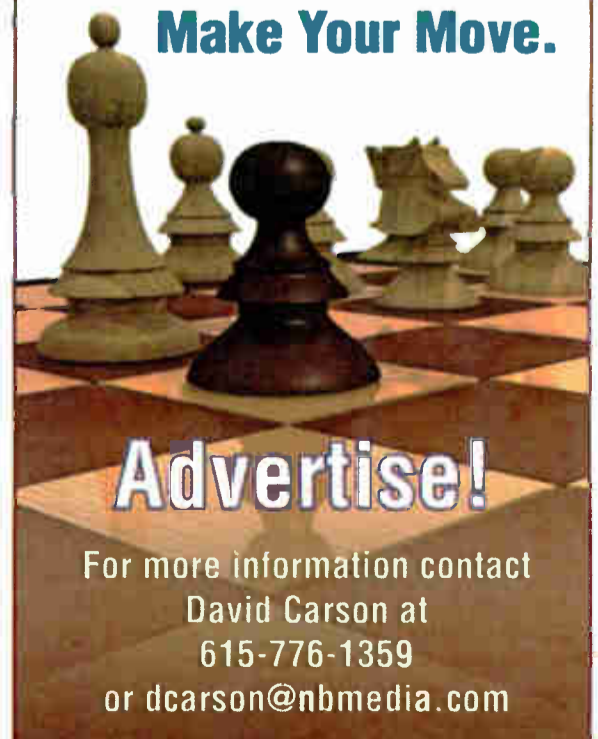
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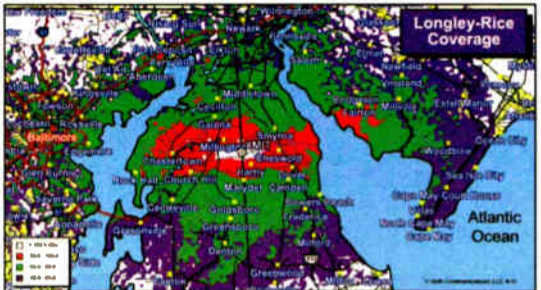
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## GUEST COMMENTARY

# Radio 2020: Ill-Conceived And Doomed to Fail

by Glenda Shrader Bos

The author is a principal/partner at Harker Research.

With radio facing declining listenership, declining revenues and an eroding status in people's lives, a marketing effort to reverse the medium's fortunes backed by the weight of the National Association of Broadcasters, Radio Advertising Bureau and HD Digital Radio Alliance ought to be reason to cheer.

The formal rollout of the campaign at the Las Vegas NAB Convention was greatly anticipating, and the NAB went all out with President/CEO David K. Rehr himself doing the presentation.

Unfortunately, it quickly became clear that this campaign is so misguided and ill-conceived that there is little chance it will turn radio around.

In fact, if the industry gets behind the campaign, it might actually do more harm than good. Rather than reignite the medium and make a strong case for radio's continuing relevancy, the campaign reinforces the negative stereotypes of radio that put us in this hole in the first place.

## Snail's pace

We get off to a slow start with the name of the campaign.

At first glance it isn't clear why a campaign launched in 2008 would have the name Radio 2020. We're 12 years away from 2020. Are we promising something great from radio in 2020? Do listeners have to wait that long for a payoff?

Perhaps the people behind Radio 2020 have some doubts about the campaign's potential impact and they are giving themselves plenty of time. Perhaps they think HD Radio will be the catalyst to reignite radio, and they think HD will take another 12 years to gain traction.

Reading the Radio 2020 press release, we learn that, "In the fall of 2007, the National Association of Broadcasters, Radio Advertising Bureau and HD Digital Radio Alliance embarked on an unprecedented initiative that we call Radio 2020 — a nod to radio's centennial year and our clear vision for the future."

So it turns out that the name is "a nod" to 1920. Radio will be 100 years old in 2020. It is hard to imagine that many people see its 100-year product life span as a positive attribute. Does longevity breed loyalty? Walkman vs. iPod, VHS vs. DVD, incandescent vs. compact fluorescent, broadband vs. dial-up.

## Update

In his commentary "Radio's Future Is Bright ... If the Suits Leave" (June 18), Pete Simon wrote of the deadline for comments to the FCC on proposals to increase station ownership diversity (MB Docket 07-294). The FCC changed the comment due dates for its localism proceeding. They are now due July 30.

Would you rather be the old or new product? Do we really want to point out that radio is 100 years old?

Admittedly, the name of a marketing campaign is not all that important as long as the heart and spirit of the campaign is on target, but it turns out that the heart of the campaign is just as misguided as the name.

The NAB press release states, "Our research shows that 92 percent of Americans believe radio is important in their daily lives. But while it is valued, radio is also taken for granted. Because it is so pervasive, radio is sometimes overlooked, just like water or electricity."

The people behind the campaign apparently believe that radio's problems are caused by people taking radio for granted, so the campaign's goal is to convince media buyers and listeners that radio shouldn't be taken for granted.

But later in the press release we find this: "Based on what we heard from our consumers, radio's intrinsic value lies in the fact that it's accessible. It's a medium where everyone can freely and easily connect to a diverse world of entertainment and information, anywhere, anytime and everywhere."

So it's bad that people take radio for granted (like water and electricity), but good that radio is so accessible anywhere, anytime and everywhere. Do the creators of the campaign think that our accessibility is good or bad? Apparently both.

This kind of undercooked fuzzy thinking pervades the campaign. Here's how Kelly O'Keefe, creator of the campaign, recently described the goals of the marketing campaign:

- Encourage users to fully explore the variety of content
- Stimulate usage in new ways and places
- Generate positive discussions about radio
- Communicate progress in content, technology and education
- Develop and support a growing community of radio evangelists

These are not goals. These are wishes. Goals are measurable and have deadlines. Apparently the deadline is 2020, but can we really measure these things? Not really. And the problems don't end there.

## Retroactive

Take a look at the campaign's Web site.

The "Radio Heard Here" logo has a dated "retro" look. Retro can convey a cool and contemporary feeling if the look invokes the past without looking like it came from the past. The logo fails on this measure. It just looks old. And the accompanying pictures just reinforce the dated feeling of the campaign. A boom box with dual cassette players is not retro — it's old.

There is a strong self-consciousness to the campaign. It is reminiscent of the uncool kid in school that worked so hard to look cool that he looked even more uncool.

See RADIO 2020, page 46 ►

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## Don't Wait for the Future

### In Support of an FM Digital Power Hike

The talk in engineering circles has been all about a possible increase in FM digital radio power, allowing HD Radio stations to increase it to as high as 10 percent of analog from the current 1 percent level.

At the NAB Show this was the hot topic for anyone involved in transmission. A rush of new ideas is being discussed on exactly how to manage such a high-power digital operation.

The reason for the buzz is that an increase in FM digital power is a good idea.

We support the concept of more digital power now, not at some point in the future. Radio must make the transition to a digital service, and at current power levels consumer acceptance may be too slow to retain the majority of our current audience in the face of competition. Increased digital power removes one of the most significant barriers to consumer acceptance: limited coverage area.

There are concerns to be addressed. Notably, the impact of increased digital carriers on first-adjacent stations needs to be studied to make sure that the risks to existing analog services are understood fully.

Analog radio still pays all the bills. Nothing will push audiences away faster than ignoring the fact that analog radios are everywhere; digital radios in consumer households still number just a few.

However, with years of digital radio and thousands of station conversions under our belts, we have the knowledge to plan the next step. Field research on receiver performance exists that can be used to generate scientifically valid protection ratios for the increased digital power. This research should lead to an agreed-upon interference standard based on mathematical predictions.

It should be possible to know with good precision where 10 percent digital injection would be harmful and where it would not cause problems.

If necessary, this standard could be used to evaluate proposals for digital power increases to an appropriate level on a

case-by-case basis, monitored by the FCC, so that upgrades would be known safe before proceeding.

There is also a concern for the expense. The first phase of digital radio deployment saw many transmitter facilities with 15-year-old equipment receiving major upgrades as a part of their conversion. This investment in FM radio mostly was just good sense, and the extra spent purely on digital generation an exciting part of keeping a station state-of-the-art.

But the large increase for digital injection that is proposed means that in many cases, relatively new equipment will have to be replaced after only a few years of operation if a station wants to upgrade FM digital power. Increasing from 1 percent digital to 10 percent will be a much harder decision than replacing an aging transmitter plant. And for those who have not yet dipped a toe into digital operation, the cost of building a 10 percent digital station will come with significant sticker shock.

If this idea is approved, many stations may not be able to take full advantage due to lack of headroom in the transmitter, increased power bills or interference to radio neighbors. At first, many stations might be limited to a smaller increase, perhaps to 2 or 3 percent of analog.

In spite of these concerns it is worth proceeding with a voluntary increase in digital power to assist the voluntary conversion from analog.

By providing an approximate match to FM analog coverage area, 10 percent digital would allow listeners to take advantage of the superior reception behavior of digital signals, especially on mobile radios. Multicast stations need the additional coverage area because of their lack of an analog fallback. A power boost also would benefit IBOC-FM datacasting, which could pay dividends even if multicast audio doesn't.

These service extensions deserve to be supported by adequate signal strength. The process of converting to up to 10 percent digital should be done with care and study, but the benefits are worth the pursuit.

— Radio World

## Radio 2020

► Continued from page 45

To be honest, this is exactly where radio is today. We so desperately want to be cool that our self-conscious efforts to look cool just come off as trying to be something we are not.

O'Keefe has been quoted saying that the retro look tested well in the research. This should be a major alarm bell for the campaign. We know we have an image problem among young demos (the future of radio according to O'Keefe), but we let them pick the imagery that invokes radio. Of course they pick imagery from the 1980s and before because they think we are from the 1980s.

The elements of the campaign rolled out so far do not appear to address any of the goals the campaign sets out to do. And while it is still early in the campaign's development, the signs so far suggest that they won't get any better. Those behind the campaign do not appear to understand either radio's strengths or the source of radio's problems.

Harker Research talks to thousands of listeners each year and has done so for nearly three decades. Successful stations throughout North America rely on our research to program and market their stations. Our clients understand that the pervasiveness and availability of radio is neither a positive nor negative attribute of radio. It is just a reality.

But radio's greatest strength comes from that pervasiveness and availability. The thousands of free over-the-air radio stations provide convenient choice. A person can listen to station A, B or C.

Radio 2020 is doomed if its goal is to focus attention on radio's breadth and reach. The campaign should be focused on radio's intimacy and connectiveness.

The campaign claims that people "love" radio, but they don't. They love radio stations, and that is a critical distinction for marketing radio. Listener passion is not directed at a single product, it is spread across over 13,000 diverse products. That's why people say "my radio station." The campaign completely ignores this, and yet it is one key reason radio is in trouble.

Consolidation has created the

"McDonaldization" of radio. Out-of-market voice tracking, centralized programming, national contesting and all the other "efficiencies" that consolidation has brought us have diminished the community, the intimacy and the uniqueness of local radio. There's less to love about local radio, and it has cost radio quarters and dollars.

Unless the creators and sponsors of Radio 2020 begin to understand the reasons we find ourselves in this perceptual and financial hole, there is little chance that Radio 2020 will do anything to help radio.



The accompanying pictures just reinforce the dated feeling of the campaign. A boom box with dual cassette players is not retro — it's old.



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**88A I/O:** 8 analog inputs and outputs. You can bring a new SQUARE up in seconds and of course use the front panel encoder for your X-Y control. Front panel status LEDs give you continuous link, status, and bit rate information as well as confirmation of any GPIO activation.

**Because the E² system doesn't rely on a third party GUI, tech support is straightforward (and 24/7).** Likewise, system operation doesn't require external PCs for continued full functionality. Best of all, 1 Gigabit protocol eliminates the latency and channel capacity restrictions associated with older technology.



**88AD I/O:** 4 analog plus 4 digital inputs and outputs—perfect for small studios or standalone routing.

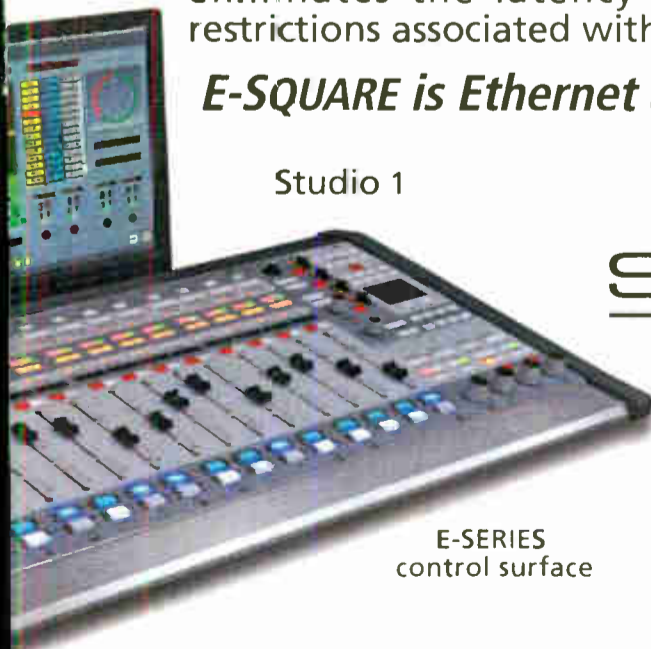
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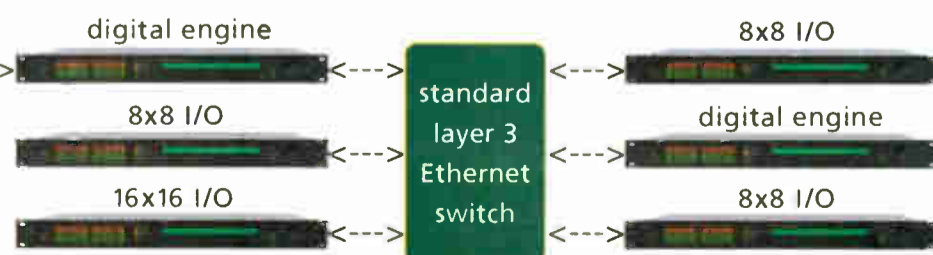
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Studio N

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